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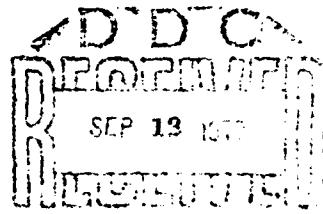
**AD- 748 000**

# **PERFORMANCE FACTORS IN UNDERWATER ENVIRONMENT**

**A DDC BIBLIOGRAPHY**

**DDC-TAS-72-42**

**AUGUST 1972**



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The 156 references in this bibliography include information on the effects of underwater environment on divers, on tools and equipment, and on human factors aspects of underwater performance.

Corporate Author-Monitoring Agency and Subject Indexes are included.

*ja*

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Security Classification

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Security Classification

14 KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
*Diving *Bibliographies Human Engineering Breathing Apparatus Controlled Atmospheres Performance(Human) Scuba Divers Small Tools Stress(Physiology) Submarine Personnel Underwater Clothing Underwater Equipment Visibility Confined Environments Pressure Breathing Underwater Communication Systems Decompression Underwater Vehicles Swimming						

26

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**PERFORMANCE FACTORS IN  
UNDERWATER ENVIRONMENT**

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**March 1942 - September 1971**

**DDC-TAS-72-42**

**AUGUST 1972**

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DEFENSE SUPPLY AGENCY  
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ALEXANDRIA, VIRGINIA 22314**

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## FOREWORD

This bibliography consists of 154 references to reports processed into the Defense Documentation Centers data bank covering the period from January 1953 through January 1972, on *Performance Factors in an Underwater Environment*. It includes the physiological effects on divers and the human factors aspects of engineering activities.

Corporate Author-Monitoring Agency and Subject Indexes are included.

BY ORDER OF THE DIRECTOR, DEFENSE SUPPLY AGENCY

OFFICIAL

  
ROBERT B. STEGMAIER, JR.  
Administrator  
Defense Documentation Center

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-135 631

PSYCHOLUGICAL CORP NEW YORK

ARRANGEMENT OF EQUIPMENT IN A SUBMARINE COMBAT  
INFORMATION CENTER

(U)

MA: 48 1V  
REPT. NU. 151 1 12  
CONTRACT: NOURI-151

CHANNELL, RALPH C.; TULCOTT, MARTIN A. S.

UNCLASSIFIED REPORT

DESCRIPTIONS: \*COMBAT INFORMATION CENTERS, HUMAN  
ENGINEERING, SHIPBORN, SUBMARINES

(M)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-231 396  
NAVAL AIR DEVELOPMENT CENTER JOHNSVILLE PA

UNDERWATER ESCAPE PROGRAM. TESTS OF F8U-1 PILOTS;  
SURVIVAL EQUIPMENT FOR POSSIBLE USE IN NADEVcen  
AUTOMATIC DITCH SYSTEM

(U)

UCT 58 IV LORCH, DANIEL L.  
REPT. NO. ED 5820  
PROJ. ADL AE 6307

UNCLASSIFIED REPORT

DESCRIPTIONS: \*BREATHING APPARATUS, \*LIFE PRESERVERS,  
\*OXYGEN EQUIPMENT, \*PILOTS, \*SURVIVAL, \*UNDERWATER  
EQUIPMENT, BAILOUT, JET FIGHTERS

(U)

UNCLASSIFIED

UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-250 084

GENERAL DYNAMICS CORP GRUTON CUNN ELECTRIC BOAT DIV

TRANSFER OF TRAINING AS A FUNCTION OF TASK DIFFICULTY  
IN A COMPLEX CONTROL SITUATION (U)

JAN 61 IV GOLUSTEIN, DONALD A.; NEWTON, JOHN M.  
REPT. NO. U411 61 JU/  
CONTRACT: N0NR3075JO

UNCLASSIFIED REPORT

DESCRIPTIONS: \*CONTROL SYSTEMS, \*TRAINING, \*TRANSFER OF TRAINING, CONTROL, DEPTH FINDING, EFFECTIVENESS, PERCEPTION, STATISTICAL ANALYSIS, SUBMARINE HULLS, SUBMARINE PERSONNEL, SUBMARINES, TESTS, TRACKING, TRAINING DEVICES, VELOCITY (U)

TWO SUBMARINES, DIFFERING WITH RESPECT TO THEIR DYNAMIC RESPONSE CHARACTERISTICS AS A FUNCTION OF DIFFERENCES IN HULL SIZE, WERE SIMULATED AT EACH OF TWO SPEEDS (SLOW AND FAST). FOUR GROUPS OF 20 SUBJECTS WERE TRAINED ON A DEPTH-KEEPING TASK, ONE GROUP ON EACH OF 4 HULL-SPEED COMBINATIONS.

FOLLOWING TRAINING, 3 SUBGRUUPS OF 5 SUBJECTS FROM EACH GRUPP WERE TESTFD ON THE OTHER 3 HULL-SPEED CONDITIONS, WITH THE REMAINING 5 SUBJECTS TESTED ON THE SAME SYSTEM. THIS WAS DONE TO DETERMINE THE DEGREE TO WHICH TRAINING ON ANY 1 OF THE 4 SYSTEMS TRANSFERS TO THE OTHER 3 SYSTEMS. IT WAS FOUND THAT, ON THE BASIS OF MEAN TIME ON TARGET SCORES PER FIVE-TRIAL BLOCK, THE MORE DIFFICULT SYSTEMS TO CONTRUL WERE THOSE WITH THE LONGER CONTROL LAGS. THESE WERE THE SMALL HULL AT SLOW SPEED AND LARGE HULL AT SLOW SYSTEMS. IT WAS ALSO FUUND THAT TRAINING ON THE MOST DIFFICULT CONTROL SYSTEM, THE LARGE HULL AT SLOW SPEED SYSTEM, PRODUCED GENERALLY BETTER TRANSFER EFFECTS THAN DID TRAINING ON ANY OTHER SYSTEM. (AUTHOR) (U)

UNCLASSIFIED

UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-257 361

GENERAL DYNAMICS CORP GRUTON CONN ELECTRIC BOAT DIV

PROJECT SUBIC. SHIP CONTROL AII. AN EMPIRICAL  
EVALUATION OF QUICKENING IN A CONTACT ANALOG  
DISPLAY

(U)

UCT 60 1V  
REPT. NU. SPU 60 131  
CONTRACT: N0NR2512UU

PLATH, DEAN W., OLAIK, HESLEY C.

UNCLASSIFIED REPORT

DESCRIPTORS: •SUBMARINE SIMULATORS, •SUBMARINES, ANALOG  
COMPUTERS, ANALOG SYSTEMS, AUTOMATIC CONTROL SYSTEMS,  
DISPLAY SYSTEMS, SIMULATION, SUBMARINE PERSONNEL,  
TRAINING, TRAINING DEVICES

(U)

IDENTIFIERS: SUBIC

(U)

THE OBJECTIVE OF THIS STUDY WAS TO DETERMINE THE  
EFFECT ON OPERATOR PERFORMANCE OF THE ADDITION OF  
QUICKENED INFORMATION TO A CONTACT ANALOG  
DISPLAY. TWO INDEPENDENT GROUPS OF FIVE  
INEXPERIENCED MALE SUBJECTS WERE REQUIRED TO SEEK AND  
KEEP COURSE AND DEPTH SIMULTANEOUSLY IN THE  
ELECTRIC BOAT DIVISION SUBMARINE SIMULATOR  
PROGRAMMED WITH SKIPJACK 20-KNOT EQUATIONS. EACH  
GROUP WAS TESTED ON ONE OF TWO SHIP CONTROL DISPLAYS:  
(1) A QUICKENED COURSE AND DEPTH DISPLAY, AND  
(2) A QUICKENED COURSE AND DEPTH DISPLAY  
SUPERIMPOSED ON A TWO-SURFACE CONTACT ANALOG  
DISPLAY WHICH INCLUDED A ROADWAY DIRECTOR AND AN  
ARTIFICIAL HORIZON. TIME ON ORDERED DEPTH, ON  
COURSE, AND ON BOTH WERE RECORDED SIMULTANEOUSLY.  
SCORES OBTAINED BY EACH GROUP WERE COMPARED WITH  
EACH OTHER AND WITH SCORES OBTAINED IN AN EARLIER  
EXPERIMENT WITH AN UNQUICKENED CONTACT  
ANALOGROADWAY DISPLAY. (AUTHOR)

(U)

UNCLASSIFIED

UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-272 913

GENERAL DYNAMICS CORP GROTON CONN ELECTRIC BOAT DIV

SUBIC: SHIP CONTROL XIV ADVANCED FBM SUBMARINE SHIP  
CONTROL CONSOLE (U)

AUG 61 IV BLAIR, W.C., SHENK, R.O.:  
REPT. NO. U411 61 102  
CONTRACT: N0NR251200

UNCLASSIFIED REPORT

DESCRIPTIONS: •COMBAT INFORMATION CENTERS, •CONTROL SYSTEMS, •DISPLAY SYSTEMS, •SUBMARINES, CONTROL, CONTROL PANELS, COSTS, DATA PROCESSING SYSTEMS, DIGITAL SYSTEMS, GUIDED MISSILES, HUMAN ENGINEERING, REDUCTION, SHIPBOME, SUBMARINE PERSONNEL, UNDERWATER-TO-SURFACE (U)  
IDENTIFIERS: SUBIC (U)

AN INTEGRATED SHIP CONTROL CONSOLE IS DESCRIBED WHICH IS DESIGNED SO ONE MAN, UNDER NORMAL WATCHSTANDING CONDITIONS, CAN PERFORM EFFECTIVELY ALL NORMAL SHIP CONTROL OPERATIONS; STEERING AND DIVING, HOVERING, SUBMERGING AND SURFACING, TRIM AND BALLAST CONTROL, MISSILE COMPENSATION, AND SPEED ORDERING CONTROL; AND SO, IN EMERGENCY SITUATIONS, AN ADDITIONAL MAN CAN PERFORM AT AN EMERGENCY HELMSMAN'S STATION. THREE MEN NOW PERFORM SHIP CONTROL OPERATIONS IN NORMAL CONDITIONS, AND A FOURTH MAN IS REQUIRED DURING AN EMERGENCY SITUATION. THIS INTEGRATED SHIP CONTROL CONSOLE IS DESIGNED FOR FBM SUBMARINES AND IS ALSO GENERALLY COMPATIBLE WITH THE PRESENT REQUIREMENTS FOR ASW AND ATTACK SUBMARINES. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-284 226

NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF

DEEP-OCEAN STUDIES, SERVICE VEHICLE

(U)

DESCRIPTIVE NOTE: REPT. UN TYPE C.  
AUG 62 41P TAYLOR, DOUGLAS;  
REPT. NO. NCEL-TN-204  
PROJ: T-FU15-01-JU1F

UNCLASSIFIED REPORT

DESCRIPTIONS: \*UNDERWATER EQUIPMENT, \*VEHICLES,  
CONSTRUCTION, DIVING, SALVAGE, UNDERWATER

(U)

A SURVEY WAS CONDUCTED TO DETERMINE PRESENT  
CAPABILITY FOR DEEP-OCEAN WORK. A SUMMARY OF  
PREVIOUS UNDERWATER EXPERIENCE AND A BRIEF  
DESCRIPTION OF 18 DIFFERENT UNDERWATER-VEHICLE  
CONCEPTS AND PROTOTYPES ARE GIVEN. CRITERIA ARE  
PROVIDED AS A BASIS FOR THE DESIGN OF TWO SUITABLE  
VEHICLES FOR THE CONSTRUCTION AND MAINTENANCE OF  
DEEP-OCEAN STRUCTURES. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-288 Y62

DUNLAP AND ASSOCIATES INC DARIEN CONN

A PREDICTOR INSTRUMENT FOR MANUAL CONTROL

(U)

DEC 62 IV KELLEY,CHARLES R.:

UNCLASSIFIED REPORT

DESCRIPTIONS: •CONTROL, •DISPLAY SYSTEMS, •SUBMARINES,  
AUTOMATIC, DEPTH FINDING, HUMAN ENGINEERING (U)

A PREDICTOR INSTRUMENT FOR MANUAL CONTROL.

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/ZHK23

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DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-400 364

NAVY EXPERIMENTAL DIVING UNIT WASHINGTON D C

A STUDY OF SWIMMER MOUTHPIECES

(U)

FEB 63 1V VAIL, JAMES R.; LINNEAVER, PAUL G., JR.;  
TOWLE, HERBERT J., JR.;  
REPT. NO. HRS 61

UNCLASSIFIED REPORT

DESCRIPTORS: \*BREATHING APPARATUS, ACCEPTABILITY,  
ANATOMY, ANTHROPOMETRY, DESIGN, DIVING, HUMAN  
ENGINEERING, MANEUVERABILITY, MOUTH, SHOCK (PATHOLOGY),  
SWIMMING (U)

DESIGN SURVEY FOR A SCUBA MOUTHPIECE WITH THE CONCEPT OF  
ORAL PHYSIOLOGY AS WELL AS ANATOMICAL STRUCTURES OF THE  
ORAL CAVITY.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-403 U24

HUMAN FACTORS RESEARCH INC LOS ANGELES CALIF

IMPROVED OPERATOR DETECTION PERFORMANCE  
CONSEQUENT TO THE USE OF OPTIMUM BIAS AND GAIN. (U)

FEB 63 3IP AKER,C.M.;  
REPT. NO. TR406 ZU  
CONTRACT: N0NR264900  
PROJ: NR153 199

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPORT ON HUMAN FACTOR PROBLEMS  
IN ANTI-SUBMARINE WARFARE.

DESCRIPTIONS: SONAR PERSONNEL, SONAR TARGETS,  
CATHODE RAY TUBES, VISION, TARGET DISCRIMINA-  
TION, CYBERNETICS, SONAR EQUIPMENT, TARGET REC-  
OGNITION, VIEWING SCREENS, DISPLAY SYSTEMS,  
BRIGHTNESS, HUMAN ENGINEERING, RELIABILITY,  
PERFORMANCE TESTS. (U)

FIVE EXPERIMENTS WERE UNDERTAKEN USING THE VISUAL  
DISPLAY OF A SONAR STACK. THE FIRST THREE WERE  
PSYCHOPHYSICAL IN NATURE, UNDERTAKEN TO DETERMINE THE  
EFFECTS OF CRT BIAS (DISPLAY BRIGHTNESS) AND  
GAIN UPON OPERATORS' TARGET DETECTION PERFORMANCE.  
AT VARIOUS RANGES, WITH AND WITHOUT REVERBERATIONS.  
OPTIMUM VALUES OF BIAS AND GAIN WERE DETERMINED.  
THE FOURTH EXPERIMENT WAS UNDERTAKEN TO DETERMINE  
VALUES OF CRT BIAS AND GAIN CONSIDERED OPTIMUM BY  
EXPERIENCED OPERATORS. IN COMPARISON WITH THE  
VALUES DETERMINED IN THE FIRST EXPERIMENT TO BE  
OPTIMUM, THE AVERAGE VALUES OF THE EXPERIENCED  
OBSERVERS REPRESENTED A PERFORMANCE LOSS OF ABOUT 10  
DECIBELS. THE FIFTH EXPERIMENT COMPARED TARGET  
DETECTION PERFORMANCE OF 26 OPERATORS IN SEARCHING  
FOR TARGETS WHEN (1), THE DISPLAY WAS AT  
EXPERIMENTALLY DETERMINED VALUES OF BIAS AND GAIN,  
WITH THAT WHEN (2) THE DISPLAY WAS AT VALUES OF  
BIAS AND GAIN SET BY THE OPERATORS. WHEN  
EXPERIMENTALLY DETERMINED VALUES OF BIAS AND GAIN  
WERE EMPLOYED, THERE WAS AN IMPROVEMENT IN THE  
PERCENTAGE OF TARGETS DETECTED BY A FACTOR OF 10, AND  
ONE QUARTER AS MANY FALSE REPORTS OF TARGETS WERE  
MADE. A BRIEF SURVEY CONDUCTED ABOARD SEVEN SHIPS  
IN PORT INDICATED THAT THE FINDINGS OF THE FOURTH  
EXPERIMENTALLY THE SAME HAD PERFORMANCE CONSEQUENT TO  
THE USE OF OPTIMUM BIAS AND GAIN. (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-406 134

NAVY MINE DEFENSE LAB PANAMA CITY FLA

DEVELOPMENT OF EMERGENCY BREATHING APPARATUS.

(U)

APR 63 21P UDUM,W.T.:  
REPT. NO. MDL-197

UNCLASSIFIED REPORT

DESCRIPTORS: \*BREATHING APPARATUS, UNDERWATER EQUIPMENT, HELICOPTERS, DITCHING, SAFETY DEVICES, NAVAL AIRCRAFT, AIR SEA RESCUES, AVIATION SAFETY, DESIGN.

(U)

AN EMERGENCY BREATHING APPARATUS DEVELOPED AT THE U. S. NAVY MINE DEFENSE LABORATORY IS DESCRIBED. THE APPARATUS WILL PERMIT CREW MEMBERS TO SUBMERGE WITH THE AIRCRAFT AND MAKE AN UN HURRIED, SAFE, UNDERWATER EXIT. A 15-MINUTE BREATHING SUPPLY IS PROVIDED IN A LIGHTWEIGHT, COMPACT, SIMPLE AND EASILY MAINTAINABLE PACKAGE, WHICH CAN BE USED BY ALMOST ANYONE AFTER A SHORT PERIOD OF INSTRUCTION.  
(AUIMUR)

(U)

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AD-414 395

NAVY MINE DEFENSE LAB PANAMA CITY FLA

DIVER'S INSTRUMENTED OBSERVATION BOARD: PAPER I,  
SCIENTIFIC DIVING SERIES.

(U)

JUL 63 11P DOWLING, G. B. I  
REPT. NO. MDL-210  
PROJ. SFU11-U1-01  
TASK: 2612

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*DIVING, INSTRUMENTATION), (\*SCIENTIFIC  
RESEARCH, UNDERWATER EQUIPMENT), RECORDING SYSTEMS,

DEPTH INDICATORS, COMPASSES

(U)

IDENTIFIERS: 1963, DIVER'S OBSERVATION BOARD

(U)

IN THE COURSE OF WORK INVOLVING DIVING BY  
SCIENTISTS, A NUMBER OF SPECIALIZED INSTRUMENTS AND  
TECHNIQUES FOR USE BY SCIENTIFIC DIVERS WERE  
DEVELOPED, ONE OF THESE BEING THE "DIVER'S  
OBSERVATION BOARD," A COMBINATION OF BASIC  
DIVING INSTRUMENTS WHICH ARE GENERALLY USED  
SEPARATELY. THE DIVER'S OBSERVATION BOARD HAS  
RESULTED IN GREATLY INCREASED EFFICIENCY OF  
OBSERVATION AND RECORDING OF SEVERAL TYPES OF  
UNDERWATER DATA OF VALUE TO OCEANOGRAPHY. IT  
CONSISTS OF A 6-BY 8-IN. WRITING BOARD IN AND ON  
WHICH ARE MOUNTED A COMPASS, DEPTH GAUGE,  
INCLINOMETER, PULL-OUT PROTRACTOR, BUBBLE LEVELS,  
PENCILS; IT HAS RULED EDGES, MEANS FOR ATTACHING  
OTHER MEASUREMENT TOOLS, AND MEANS FOR ATTACHMENT TO  
THE DIVER'S BELT. A FUNCTIONAL DESCRIPTION IS  
GIVEN AND SOME APPLICATIONS AND THEIR RESULTS ARE  
DISCUSSED. (AUTHOR)

(U)

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DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-414 395  
NAVY MINE DEFENSE LAB PANAMA CITY FLA

DIVER'S INSTRUMENTED OBSERVATION BOARD: PAPER I:  
SCIENTIFIC DIVING SERIES. (U)

JUL 63 1IP DOWLING, G. B.  
REPT. NO. MDL-210  
PROJ: SFU11-U1-01  
TASK: 2612

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*DIVING, INSTRUMENTATION), (\*SCIENTIFIC  
RESEARCH, UNDERWATER EQUIPMENT), RECORDING SYSTEMS.

DEPTH INDICATORS, COMPASSES (U)  
IDENTIFIERS: 1963, DIVER'S OBSERVATION BOARD (U)

IN THE COURSE OF WORK INVOLVING DIVING BY  
SCIENTISTS, A NUMBER OF SPECIALIZED INSTRUMENTS AND  
TECHNIQUES FOR USE BY SCIENTIFIC DIVERS WERE  
DEVELOPED, ONE OF THESE BEING THE "DIVER'S  
OBSERVATION BOARD," A COMBINATION OF BASIC  
DIVING INSTRUMENTS WHICH ARE GENERALLY USED  
SEPARATELY. THE DIVER'S OBSERVATION BOARD HAS  
RESULTED IN GREATLY INCREASED EFFICIENCY OF  
OBSERVATION AND RECORDING OF SEVERAL TYPES OF  
UNDERWATER DATA OF VALUE TO OCEANOGRAPHY. IT  
CONSISTS OF A 6-BY 8-IN. WRITING BOARD IN AND ON  
WHICH ARE MOUNTED A COMPASS, DEPTH GAUGE,  
INCLINOMETER, PULL-OUT PROTRACTOR, BUBBLE LEVELS,  
PENCILS; IT HAS RULED EDGES, MEANS FOR ATTACHING  
OTHER MEASUREMENT TOOLS, AND MEANS FOR ATTACHMENT TO  
THE DIVER'S BELT. A FUNCTIONAL DESCRIPTION IS  
GIVEN AND SOME APPLICATIONS AND THEIR RESULTS ARE  
DISCUSSED. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-447 530

NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN

PREDICTION OF ADJUSTMENT TO PROLONGED SUBMERGENCE  
ABOARD A FLEET BALLISTIC MISSILE SUBMARINE. IV.  
PSYCHOLOGICAL INDICES, (U)

NOV 63 3IP WEYBURN, BENJAMIN B. ;  
REPT. NU. 410 ,VOL. 22 18  
MONITOR: NAVMED MRUOS 14 2200 1 06

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*SUBMARINE PERSONNEL, BEHAVIOR),  
(\*BEHAVIOR, SUBMARINE PERSONNEL), ADJUSTMENT  
(PSYCHOLOGY), BALLISTIC MISSILE SUBMARINES, CORRELATION  
TECHNIQUES, STABILITY, STRESS (PSYCHOLOGY), ADAPTATION  
(PHYSIOLOGY), EMOTIONS, VENTILATION, RESPIRATION,  
PSYCHOPHYSIOLOGY, ATTITUDES, NAVY RESEARCH, NERVOUS  
SYSTEM, MOTIVATION (U)  
IDENTIFIERS: SUBMERGENCE (U)

FOURTEEN PSYCHOPHYSIOLOGICAL INDICES OF RESPONSE TO  
HYPERVENTILATION AND BREATHOLDING AND TO  
DISCRIMINATION-CONFLICT STRESS WERE COMBINED WITH  
MEASURES OF NEUROTICISM, MOTIVATION, AND APTITUDE TO  
FORM A CORRELATION MATRIX INCLUDING ADJUSTMENT  
RATINGS OBTAINED FROM 200 MEN DURING TWO SUCCESSIVE  
CRUISES ABOARD A NUCLEAR SUBMARINE. PATTERNS OF  
PSYCHOPHYSIOLOGICAL INDICATORS WITH ADJUSTMENT  
CRITERIA WERE IDENTIFIED BY FACTOR VARIABLES RESULTED  
IN MULTIPLE R'S RANGING FROM .40 TO .62. FOR  
THE PURPOSE OF COMMUNICATION, THESE FACTORS WERE  
LABELED LIMITED ADJUSTMENT POTENTIAL, OPTIMAL  
ADJUSTMENT POTENTIAL, AUTONOMIC RESILIENCY,  
AUTONOMIC FEEDBACK, AND STRESS RESPONSIVITY.  
THE STRUCTURE OF THE FACTORS SUGGESTED  
SOMATOPSYCHOLOGICAL DIMENSIONS OF USE IN PERSONALITY  
ASSESSMENT ESPECIALLY WHEN SELECTION OF MEN FOR  
HAZARDOUS DUTY IS INVOLVED. (AUTHOR) (U)

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UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-464 326

HUMAN FACTORS RESEARCH INC LOS ANGELES CALIF

HUMAN FACTOR PROBLEMS IN ANTI-SUBMARINE WARFARE.  
SONAR OPERATOR DETECTION PERFORMANCE AT SEA. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,

APR 64 14P BAKER, C. H.; PARKER, E. L.;

RITTGER, J. C.;

REPT. NU. TR-206-26

CONTRACT: N0NR2649UU

PROJ: NR153 199

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTIONS: (+SONAR PERSONNEL,  
PERFORMANCE(HUMAN)), (+ANTISUBMARINE WARFARE,  
SONAR PERSONNEL), SONAR EQUIPMENT, OPERATION,  
SONAR TARGETS, DETECTION, GAIN, VOLTAGE,  
EFFECTIVENESS, UNDERWATER OBJECT LOCATORS, NAVAL  
TRAINING, IDENTIFICATION SYSTEMS, SONAR (U)  
IDENTIFIERS: AN/SQS-23, DLG 22 (U)

AN EARLIER EXPERIMENT USING TRAINING EQUIPMENT  
ASHORE INDICATED THAT A SIGNIFICANT IMPROVEMENT COULD  
BE EXPECTED IN SONAR TARGET DETECTION PERFORMANCE BY  
EMPLOYING BIAS AND GAIN VOLTAGES WHICH DIFFERED FROM  
THOSE TYPICALLY EMPLOYED. THIS REPORT DESCRIBES A  
SIMILAR, THOUGH BRIEFER, EXPERIMENT UNDERTAKEN AT SEA  
WITH AN AN/SQS-23A SONAR. IN A PRELIMINARY  
EXPERIMENT, USING PROJECT PERSONNEL AS OBSERVERS,  
DETECTION PERFORMANCE WAS DETERMINED FOR SEVERAL  
VALUES OF BIAS AND GAIN. IN THE MAIN EXPERIMENT  
DETECTION PERFORMANCE OF THE SHIP'S EIGHT SONAR  
OPERATORS WAS COMPARED WHEN (1) EMPLOYING THEIR  
FAVORED VALUES OF BIAS AND GAIN, AND WHEN (2)  
EMPLOYING VALUES SELECTED AS A RESULT OF THE  
PRELIMINARY EXPERIMENT. IT WAS FOUND THAT BY  
INCREASING THE GAIN (ACTUALLY DECREASING THE GAIN  
VOLTAGE 3.3 VOLTS) ABOVE THAT TYPICALLY SELECTED BY  
OPERATORS OF AN AN/SQS-23A SONAR OPERATING AT  
SEA, TARGET DETECTION PERFORMANCE WITH RESPECT TO  
TARGETS GENERATED BY THE SONAR TEST SET WAS IMPROVED  
BY APPROXIMATELY 3 DECIBELS. THIS RESULT PROVIDES  
OBJECTIVE EVIDENCE FOR THE VALIDITY OF THE FREQUENTLY  
MADE OBSERVATION THAT MANY SONAR OPERATORS SEARCH AT  
A GAIN LEVEL SUBSTANTIALLY BELOW THE UPTIMUM.

(AUTHOR)

(U)

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UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-477 357 5/9  
NAVAL SUBMARINE MEDICAL CENTER GROTON CONN

THE NSMC SONAR OPERATOR ALERTNESS RESEARCH APPARATUS:  
DESCRIPTION AND INSTRUCTIONS FOR USE. (U)

DESCRIPTIVE NOTE: SPECIAL REPT.,  
SEP 65 12P HARRIS, J. DONALD ;  
REPT. NO. SR-65-6  
MONITOR: NAVMED MF022-03.U3-9U2U-03

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SONAR PERSONNEL,  
PERFORMANCE(HUMAN)), ATTENTION, RESPONSE, TEST  
EQUIPMENT, PORTABLE, INSTRUCTION MANUALS, DESIGN,  
AUDITORY SIGNALS, AUTOMATIC, BALLISTIC MISSILE  
SUBMARINES, REACTION(PSYCHOLOGY), SHIPBORNE,  
AUDITORY PERCEPTION, LABORATORY EQUIPMENT (U)  
IDENTIFIERS: POLARIS (U)

THE DESIGN WAS INVESTIGATED OF A SIMPLE PORTABLE  
SYSTEM WITH WHICH TO PERFORM RESEARCH ON SONAR  
OPERATOR VIGILANCE, IN THE LABORATORY AND ESPECIALLY  
WHILE UNDERWAY IN SUBMARINES. AN INEXPENSIVE  
AUTOMATIC SYSTEM WAS DERIVED TO PRESENT SIGNALS AND  
BACKGROUND NOISE TO A LISTENER, AND TO RECORD HIS  
RESPONSES (TOGETHER WITH STRENGTHS OF SIGNALS AND  
NOISE) SO THAT OVER EXTENDED VIGILANCE TESTING  
SESSIONS THE DETECTION PERFORMANCE OF THE OPERATOR  
MAY BE SPECIFIED AT SELECTED INTERVALS. THE SYSTEM  
IS USEFUL AS A RESEARCH TOOL IN SPECIFYING  
DIFFERENCES AMONG LISTENERS IN DETECTION ABILITY, IN  
RESISTANCE TO MUNITIONARY, IN EFFECT OF SIGNAL DENSITY,  
TIME ON WATCH, DRUGS, GROUP INTERACTIONS, ETC.  
(AUTHUR) (U)

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UNCLASSIFIED

/ZHK23

UNCLASSIFIED

UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-601 U44  
NAVAL MEDICAL RESEARCH INST BETHESDA MD

THERMAL PROTECTION DURING IMMERSION IN COLD  
WATER.

(U)

DESCRIPTIVE NOTE: RESEARCH REPT. NO. 1  
MAR 64 ZSP BECKMAN, E. L. ;  
PROJ: MRUDS 13 4001 U6

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED AT THE SECOND SYMPOSIUM  
ON UNDERWATER PHYSIOLOGY, WASHINGTON, D. C., 25-26  
FEB 63

DESCRIPTIONS: (UNDERWATER CLOTHING, BODY TEMPERATURE).  
(BODY TEMPERATURE, UNDERWATER CLOTHING), EXPOSURE,  
UNDERWATER, PROTECTIVE CLOTHING, RESISTANCE  
(ELECTRICAL), BATTERIES AND COMPONENTS, BLANKETS,  
SWIMMING, THERMAL CONDUCTIVITY, THERMAL INSULATION,  
HEAT, WOOLEN TEXTILES, THICKNESS, SCUBA DIVERS, HEAT  
TRANSFER, RUBBER, FOAM RUBBER

(U)

THE PHYSICAL PRINCIPLES WHICH PERTAIN TO HEAT LOSS  
FROM THE HUMAN BODY WHEN IMMERSSED IN WATER AT LOWER  
TEMPERATURES THAN ITS OWN, TOGETHER WITH THE  
PHYSIOLOGICAL MECHANISMS WHICH ARE ACTIVATED IN  
MAINTAINING THERMAL BALANCE ARE REVIEWED AND RELATED  
TO THE PROBLEMS OF THERMAL BALANCE OF UNDERWATER  
SWIMMERS. DATA ON THE AMOUNT OF HEAT LOST UNDER  
VARIOUS CONDITIONS OF WATER TEMPERATURE, BODY  
INSULATION, AND RATES OF HEAT PRODUCTION ARE  
PRESENTED. THE LIMITED EFFECTIVENESS OF INCREASING  
INTERNAL AND EXTERNAL BODY INSULATION IS ESTABLISHED  
BY THIS DATA. THE PROPOSAL OF A METHOD TO  
COUNTERACT THE BODY HEAT LOSS OF UNDERWATER SWIMMERS  
BY THE USE OF ELECTRICAL RESISTANCE CLOTHING IS  
PRESENTED AS BEING FEASIBLE WITHIN THE PRESENT STATE  
OF THE ART OF BATTERY AND BLANKET MANUFACTURE.

(AUTHOR) (U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-609 49U

SCRIPPS INSTITUTION OF OCEANOGRAPHY SAN DIEGO CALIF MARINE  
PHYSICAL LAB

HANIPULATORS AND SPECIAL DEVICES,

(U)

JUL 64 17P ANDERSON, VICTOR C., JO'NEAL, M.

A. I

REPT. NU. MPL-U-5U/64 ,SIO-REF-64-16

CONTRACT: NONR2216US

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPT. ON PROJ. SEABED.

DESCRIPTORS: (OCEANOGRAPHIC EQUIPMENT, UNDERWATER EQUIPMENT), (POSITIONING DEVICES (MACHINERY), UNDERWATER EQUIPMENT), SONAR, UNDERWATER LIGHTS, UNDERWATER OBJECT LOCATORS, SMALL TOOLS, UNDERWATER CUTTING, HYDRAULIC SYSTEMS, TELEVISION COMMUNICATION SYSTEMS, UNDERWATER, TEST FACILITIES, HYDRAULIC PRESSURE PUMPS, SEA WATER  
(U)  
IDENTIFIERS: SEABED PROJECT (U)

THE IMPORTANT FACTORS INVOLVED IN THE PERFORMANCE OF WORK IN THE DEEP OCEAN ARE DISCUSSED, AND THE REQUIREMENTS FOR SPECIAL DEVICES WHICH MAY BE USED TO ENHANCE THE EFFICIENCY OF THIS WORK ARE OUTLINED. THE BASIC REQUIREMENTS OF OBSERVATIONS AND MANIPULATION POINT TO SPECIFIC NEEDS FOR TECHNOLOGICAL DEVELOPMENTS BUT DO NOT CALL FOR ANY EXTENSIVE PROGRAM OF FUNDAMENTAL RESEARCH.  
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-610 784

HUMAN FACTORS RESEARCH INC LOS ANGELES CALIF

RESEARCH ON THE DEVELOPMENT OF SHIPBOARD PERFORMANCE  
MEASURES AND PERFORMANCE JUDGMENTS. (U)

DESCRIPTIVE NOTE: FINAL REPT.

JAN 65 26P

CONTRACT: NONR124160

PROJ: NR153 165

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (1) SUBMARINE PERSONNEL, PERFORMANCE TESTS; (2) PERFORMANCE TESTS, SUBMARINE PERSONNEL; PERFORMANCE (HUMAN), PSYCHOMETRICS, APTITUDE TESTS, ATTITUDES, OFFICER PERSONNEL, NAVAL PERSONNEL, STRESS (PSYCHOLOG (U))  
IDENTIFIERS: JUDGMENT, PREDICTION (U)

SUMMARILS ARE PRESENTED OF RESEARCH CONDUCTED ON THE MEASUREMENT OF THE PERFORMANCE OF ENLISTED PERSONNEL SERVING ABOARD SUBMARINES. TOPICS INCLUDE: (1) THE USE OF PRACTICAL PERFORMANCE TESTS; (2) COMPARISONS OF RATED AND TESTED ABILITIES TO DO CERTAIN JOB TASKS; (3) INTERRELATIONSHIPS BETWEEN APTITUDE TEST SCORES, PERFORMANCE IN SUBMARINE SCHOOL, AND SUBSEQUENT PERFORMANCE IN SUBMARINES; (4) PERFORMANCE UNDER STRESS; (5) FACTOR ANALYTIC STUDIES OF APTITUDES, INTERESTS, AND PRACTICAL PERFORMANCE SKILLS FOR NAVY MACHINERY REPAIRMAN STUDENTS; (6) PREDICTABILITY OF RATINGS; (7) COMPARISON OF SUPERVISORY RATINGS AND PRACTICAL PERFORMANCE TESTS; (8) FACTORS INFLUENCING JUDGMENT OF HUMAN PERFORMANCE; (9) RATERS' SKILLS AND ATTITUDES; AND (10) INFLUENCE OF UNUSUAL PERFORMANCES AND TIME-ORDER ON PERFORMANCE JUDGMENT. AN INDEX OF REPORTS PREPARED UNDER THIS CONTRACT IS ALSO GIVEN. (U)

UNCLASSIFIED

UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AU-613 J7U  
NAVY EXPERIMENTAL DIVING UNIT WASHINGTON D C

ADAPTATION OF HELIUM-OXYGEN TO MIXED-GAS SCUBA. (U)

DESCRIPTIVE NOTE: INTERIM REPT.,  
MAR 65 7 UP WURKMAN, ROBERT D. I.  
REPT. NO. NEUU-RM-1-65  
PROJ: SFULL-U6-01  
TASK: 3361

UNCLASSIFIED REPORT

DESCRIPTIONS: (BREATHING APPARATUS, DIVING), (DIVING-BREATHING APPARATUS), (SCUBA DIVERS, BREATHING APPARATUS), HELIUM, OXYGEN, MIXTURES, DECOMPRESSION SICKNESS, UNDERWATER EQUIPMENT, HUMAN ENGINEERING, SWIMMING (U)

A DECOMPRESSION PROCEDURE FOR USE OF HELIUM-OXYGEN MIXTURES IN MIXED GAS SCUBA TO PERMIT REPETITIVE DIVES TO A DEPTH OF 200 FEET HAS BEEN DEVELOPED EMPLOYING MODIFIED HALDANE PRINCIPLES. THE REPETITIVE DIVING PROCEDURE PROVIDES A SYSTEM BY WHICH A DIVER CAN DETERMINE THE NECESSARY INCREASE IN DECOMPRESSION TIME ON SUCCESSIVE DIVES, BASED ON THE AMOUNT OF EXCESS INERT GAS TENSION IN BODY TISSUES AFTER COMPLETION OF PREVIOUS DIVES. THE AMOUNT OF DECOMPRESSION REQUIRED IS DECREASED BY THE TIME INTERVAL AT THE SURFACE BETWEEN DIVES. THE INFORMATION REQUIRED FOR USE OF THIS SYSTEM IS OBTAINED FROM FOUR TABLES: (1) DECOMPRESSION TABLE (2) NO DECOMPRESSION DIVE TABLE (3) SURFACE INTERVAL CREDIT TABLE AND (4) REPETITIVE DIVE TIME TABLE. A METHOD FOR USE OF OXYGEN DECOMPRESSION AT 30 AND 20 FOOT WATER STOPS IS ALSO PROVIDED. THE VALIDITY OF THIS PROCEDURE IS BASED ON TESTS OF 466 DIVES IN WHICH 28 THREE-DIVE SERIES AND 68 OXYGEN DECOMPRESSION DIVES WERE MADE. THE PROCEDURE AS REPORTED IS CONSIDERED SATISFACTORY AND IS RECOMMENDED FOR FURTHER TESTING UNDER OPERATIONAL CONDITIONS IN THE FIELD BEFORE SERVICE-WIDE USE. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AU-614 713  
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN

AN INVESTIGATION OF THE RED ILLUMINATION OF THE  
SUBMARINE CONNING TOWER. (U)

DESCRIPTIVE NOTE: INTERVAL REPT. NO. 1,  
MAK 46 SIP VERPLANKING. SO;  
REPT. NO. NMNL-102  
PROJ: NAVMED-X-S19

UNCLASSIFIED REPORT

DESCRIPTIONS: (SUBMARINES, ILLUMINATION),  
(ILLUMINATION, ADAPTATION (PHYSIOLOGY)), VISION,  
COLORS, PERFORMANCE TESTS, SUBMARINE PERISCOPES,  
TARGETS, POSITION FINDING, SKY BRIGHTNESS, STIMULATION,  
THRESHOLLS (PHYSIOLOGY), HUMAN ENGINEERING, TABLES (U)  
IDENTIFIERS: CONNING TOWERS (U)

A SERIES OF EXPERIMENTS ON CONNING TOWER  
ILLUMINATION WAS UNDERTAKEN TO DETERMINE THE EXTENT  
TO WHICH LABORATORY FINDINGS ON THE EFFECT OF DIM RED  
LIGHT UPON NIGHT VISION MAY BE DUPLICATED IN A  
PRACTICAL SITUATION. SUCH EXPERIMENTS WERE  
CONSIDERED NECESSARY NOT ONLY BECAUSE AVAILABLE DATA  
ON DARK ADAPTATION INDICATED THAT SOME DECREMENT IN  
NIGHT VISION PERFORMANCE MIGHT BE EXPECTED, BUT ALSO  
SUCH A DECREMENT, ALTHOUGH SMALL, HAS BEEN FOUND IN  
THE ABSOLUTE VISUAL THRESHOLD. THIS DECREMENT,  
EXPERIMENTALLY INDUCED BY A UNIFORMLY ILLUMINATED  
FIELD, AND MEASURED BY A PRECISE TECHNIQUE, MIGHT BE  
EXPECTED TO APPEAR IN A NON-UNIFORMLY ILLUMINATED  
SPACE SUCH AS A CONNING TOWER, WHEN THE PERFORMANCE  
IN QUESTION IS ONE WHICH IS AFFECTED BY MANY OTHER  
FACTORS THAN THE STATE OF THE ADAPTATION OF THE  
RETINA. IT IS THE PRESENT PROBLEM TO DETERMINE  
WHETHER OR NOT IT DOES. A PERFORMANCE SIMULATING  
THE VISUAL TASK OF AN OFFICER AT THE PERISCOPE WAS  
THEREFORE MEASURED UNDER THREE CONDITIONS OF CONNING  
TOWER ILLUMINATION. THIS PERFORMANCE WAS THE  
DETECTION OF THE POSITION OF A TARGET IN THE DIMLY  
ILLUMINATED FIELD OF A SIMULATED PERISCOPE. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-618 USC

NAVY EXPERIMENTAL DIVING UNIT WASHINGTON D C

CARBON DIOXIDE ABSORPTION SYSTEMS FOR SCUBA. 20  
THEORY AND APPLICATIONS OF A NOVEL, NON-CYLINDRICAL  
LOW-RESISTANCE, CO<sub>2</sub> ABSORPTION CANISTER FOR  
SCUBA. (U)

DESCRIPTIVE NOTE: RESEARCH REPT.,  
JUN 65 35P GOODMAN, M. W.; JAMES, T. W.;  
REPT. NO. NEUU-RH-4-65  
PROJ: SFU11-U6-05  
TASK: 11511

UNCLASSIFIED REPORT

DESCRIPTIONS: (\*SCUBA DIVERS, BREATHING APPARATUS),  
(\*BREATHING APPARATUS, UNDERWATER EQUIPMENT),  
(\*CARBON DIOXIDE, BREATHING APPARATUS),  
(\*ABSORPTION, CARBON DIOXIDE), DIVING, PRESSURE,  
CONTAINERS, RECTANGULAR BODIES, DESIGN, FLUID  
FLOW, LIFE SUPPORT, RESPIRATORS (U)  
IDENTIFIERS: FLATCAN (U)

RESULTS OF UNDERWATER SWIMMING EXPERIENCES,  
BREATHING-MACHINE EXPERIMENTS, AND  
RECUMPRESSION CHAMBER TESTING TO ELEVEN ATMOSPHERES  
ABSOLUTE PRESSURE (330 FEET SEA WATER) WITH NEW  
SCUBA CARBON DIOXIDE ABSORPTION CANISTERS ARE  
REPORTED. GRANULAR BARALYME WAS EMPLOYED AS THE  
CHEMICAL ABSORBING AGENT. CERTAIN COMPARISONS, BOTH  
OF DESIGN AND FUNCTIONAL HISTORY, WITH CONVENTIONAL  
CYLINDRICAL CANISTER SYSTEMS ARE EMPHASIZED AND  
ANALYZED, AND THEORY OF THE LOW-RESISTANCE DEVICE IS  
DISCUSSED. AS A THREE-DIMENSIONAL GEOMETRIC SOLID,  
THE ESSENTIAL CANISTER SHAPE IS THAT OF A FRUSTUM OF  
A RECTANGULAR PYRAMID. IN THE TWO-DIMENSIONAL  
ASPECT OF GREATEST SURFACE THE CANISTER PERIMETER  
PRESENTS AS A TRUNCATED ISOSCELES TRAPEZOID. INLET  
AND EXHAUST HOSE FITTINGS ARE SITUATED NEAR THE  
EXTREMES OF THE LARGER RECTANGULAR BASE OF THE  
CANISTER. THE ACRONYMS FLATCAN AND  
FLATCANISTER DENOTE FLAT, LOW RESISTANCE,  
CARBON DIOXIDE ABSORPTION, TRAPEZOIDS  
CANISTERS. MEAN DELTA AND RESISTANCE RESULTS FOR  
NINE CYLINDRICAL CANISTERS (16 MECHANICAL  
RESPIRATOR EXPERIMENTS) ARE ABOUT 908 AND 158  
HIGHER, RESPECTIVELY, THAN THE COMPARABLE MEAN DATA  
FOR SEVEN FLATCAN PROTOTYPES (15 RESPIRATOR  
EXPERIMENTS). (U)

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/ZHK23

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-618 194  
OFFICE OF NAVAL RESEARCH WASHINGTON D C

AN EXPERIMENTAL ELEVEN-DAY UNDERSEA SATURATION DIVE  
AT 193 FEET. (U)

DESCRIPTIVE NOTE: SUMMARY RLPT.,  
JUN 65 66P O'NEAL, H. A. ; BOND, G. ;  
LANFLEAR, R. ;ODUM, T. ;  
REPT. NO. UNR-ACH-106  
PROJ: NRZ9U UDU ,RN011 05 05

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPT. ON PROJ. SEALAB.

DESCRIPTIONS: (LABORATORIES, UNDERWATER),  
(ADAPTATION(PHYSIOLOGY), DIVING), (DIVING,  
ADAPTATION(PHYSIOLOGY)), OCEANOGRAPHIC EQUIPMENT,  
UNDERWATER EQUIPMENT, OCEAN BOTTOM, LIFE SUPPORT,  
STRESS(PHYSIOLOGY), SWIMMING, DECOMPRESSION,  
HEMATOLOGY, PSYCHOLOGY, TOLERANCES(PHYSIOLOGY) (U)  
IDENTIFIERS: SEALAB PROJECT (U)

AN UNDERSEA, AMBIENT-PRESSURE, GAS-FILLED, NINE-FUOTDIAMETER BY 40-FT-LUNG LABORATORY WAS PLACED ON THE OCEAN FLOOR OFF ANGUS ISLAND NEAR BERMUDA. FOUR MEN OCCUPIED THE LABORATORY. DURING THIS PERIOD OF SATURATION DIVING ON A HE-O2-N2 GAS MIXTURE, THE MEN PERFORMED WORK, ATE, AND SLEPT WITHIN THE DRY LABORATORY AND MADE WORKING SWIMS IN THE OCEAN SPACES SURROUNDING THE LABORATORY. PHYSIOLOGICAL OBSERVATIONS AND MEASUREMENTS WERE MADE OF THE LABORATORY OCCUPANTS. THE SEALAB SUBJECTS REACHED A STATE OF EQUILIBRIUM (Tissue SATURATION) WITH THEIR BREATHING MEDIUM AT DEPTH DURING THE FIRST 24-HR PERIOD ON THE BOTTOM. AFTER THIS TIME, ADDITIONAL EXPOSURE DID NOT INCREASE THE DECOMPRESSION SCHEDULE. DECOMPRESSION TIME FROM A "SATURATION" DIVE TO 200 FT MAY BE AS LITTLE AS 30 HR, DEPENDING ON CONDITIONS. SEALAB I PROJECT DEMONSTRATE: 1. THAT MAN CAN PERFORM USEFUL WORK AT 200 FT AND UELPER WITH THIS TECHNIQUE OF INTEGRATING THE HUMAN MORE FULLY WITH HIS UNDERSEA ENVIRONMENT, RATHER THAN HAVING HIM MAKE BRIEF, EXPENSIVE FORAYS INTO IT, ALWAYS RETURNING TO SURFACE PRESSURE FOR HIS NECESSITIES OF LIFE. 2. NO ADVERSE PHYSIOLOGICAL EFFECTS AS A RESULT OF AQUANAUT EXPOSURE TO THE EXPERIMENTAL CONDITIONS OF THE SEALAB I PROJECT. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-619 304

NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA

PERFORMANCE IN THE PRE-FLIGHT WATER SURVIVAL COURSE  
AS A PREDICTOR OF SUCCESS IN FLIGHT TRAINING. (U)

DESCRIPTIVE NOTE: SPECIAL REPT.,

JUN 65 13P HUTCHINS,CHARLES W. JR.;

POMAROLLI,RICHARD S.;

REPT. NO. SR-65-3

UNCLASSIFIED REPORT

Reproduced from  
best available copy.

SUPPLEMENTARY NOTE:

DESCRIPTORS: (NAVAL TRAINING, PILOTS), (SURVIVAL,  
NAVAL TRAINING), FLIGHT, PHYSICAL FITNESS,  
SWIMMING, PERFORMANCE(HUMAN), STUDENTS,  
STATISTICAL ANALYSIS, CORRELATION TECHNIQUES (U)

THE WATER SURVIVAL COURSE GRADES OF 1500 PRE-  
FLIGHT STUDENTS WERE ANALYZED TO DETERMINE THE  
UTILITY OF THESE GRADES AS PREDICTORS OF EVENTUAL  
COMPLETION OR FAILURE IN THE FLIGHT TRAINING PROGRAM.  
THE WHEERRY-WOOLITTLE METHOD OF TEST SELECTION  
WAS USED TO EVALUATE TWO PERFORMANCE MEASURES FROM  
THE COURSE: MID-COURSE GRADE AND THE SWIM-  
HOLD STATUS. RESULTS INDICATE THAT BOTH THESE  
MEASURES MAKE SMALL BUT STATISTICALLY SIGNIFICANT  
CONTRIBUTIONS TO THE VALIDITY OF THE MULTIPLE  
PREDICTOR. THERE IS EVIDENCE THAT THE VALUE OF THE  
WATER SURVIVAL COURSE AS A PREDICTOR DERIVES MORE  
FROM A STUDENT'S INITIAL ABILITY AS A SWIMMER THAN  
FROM HIS PROGRESS IN THE COURSE. (AUTHOR) (U)

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/ZHK23

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UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-621 627

NAVAL PERSONNEL PROGRAM SUPPORT ACTIVITY WASHINGTON D C  
PERSONNEL RESEARCH LAB

A PRELIMINARY STUDY OF MAN IN THE SEA DIVER PERSONNEL  
AND TRAINING IMPLICATIONS, (U)

JUL 65 4UP PRUPST,A. S. ;  
REPT. NU. ARM-66-5

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (♦DIVING, NAVAL PERSONNEL), (♦NAVAL  
PERSONNEL, SCUBA DIVERS), (♦SCUBA DIVERS,  
TRAINING), SELECTION, PERSONNEL MANAGEMENT,  
MILITARY REQUIREMENTS, HAZARDS, WAGES, BREATHING  
APPARATUS, UNDERWATER CLOTHING, UNDERWATER  
EQUIPMENT, SONAR EQUIPMENT, NAVIGATION AIDS,  
SAFETY DEVICES, UNDERWATER COMMUNICATION SYSTEMS,  
OCEANOGRAPHIC EQUIPMENT, TELEVISION COMMUNICATION  
SYSTEMS, LIGHTING EQUIPMENT, SALVAGE (U)  
IDENTIFIERS: SEALAB PROJECT (U)

THE REPORT PROVIDES THE CHIEF OF NAVAL  
OPERATIONS, BUREAU OF NAVAL PERSONNEL,  
SPECIAL PROJECTS OFFICE, FLEET COMMANDERS,  
AND NAVAL SCHOOLS WITH PRELIMINARY INFORMATION  
RELATED TO THE DIVER PERSONNEL AND TRAINING  
REQUIREMENTS FOR THE MAN-IN-THE-SEA PROGRAM,  
AND WAS PREPARED AT THE REQUEST OF PERS-  
A41 (PERSONNEL PROGRAM MANAGEMENT  
DIVISION). THE RESEARCH MEMORANDUM DISCUSSES  
PROJECTED DIVER REQUIREMENTS IN THE NAVY AND  
INCLUDES A REVIEW OF EXISTING AND ANTICIPATED SKILLS  
AND KNOWLEDGE, DEPTH QUALIFICATIONS, EQUIPMENT  
KNOWLEDGE REQUIRED, PERSONNEL SELECTION PRE-  
REQUISITES, HAZARDOUS DUTY IMPLICATIONS, NEC AND  
DIVING FAT CONSIDERATIONS, TYPES OF UNDERWATER TASKS  
PERFORMED, AND THE TECHNICAL SKILLS REQUIRED.  
COMPARISON OF EXISTING, VERSUS PROJECTED DIVER  
PERSONNEL AND TRAINING REQUIREMENTS ARE DISCUSSED AND  
REVIEWED IN LIGHT OF REQUIREMENTS ENVISIONED FOR AN  
ON-GOING MAN-IN-THE-SEA EFFORT WITHIN THE NAVY.  
(AUTHOR) (U)

UNCLAS<sup>23</sup>IFIED

/ZHK23

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-626 U64  
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA

INSTALLATION AND EVALUATION OF A TRAINER FOR AVIATION  
UNDERWATER SURVIVAL. (U)

DESCRIPTIVE NOTE: SPECIAL REPT.,  
FEB 56 25P HALL,ARTHUR L.;  
REPT. NO. NSAM-SR-56-4

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTIONS: (\*SURVIVAL, SEA RESCUE EQUIPMENT),  
(\*AVIATION ACCIDENTS, SEA RESCUE EQUIPMENT), (\*SEA  
RESCUE EQUIPMENT, AVIATION ACCIDENTS), (\*TRAINING  
DEVICES, SEA RESCUE EQUIPMENT), NAVAL AVIATION,  
AVIATION PERSONNEL, DITCHING, RESCUE KITS,  
UNDERWATER EQUIPMENT, OXYGEN, BREATHING MASKS,  
FLIGHT CLOTHING, FEASIBILITY STUDIES (U)

IN 1952 IT WAS FOUND THAT STANDARD NAVAL AVIATION  
OXYGEN EQUIPMENT OPERATED SATISFACTORILY UNDER WATER.  
THE CHIEF OF NAVAL AIR TRAINING DESIRED  
THAT THIS EQUIPMENT BE INSTALLED AND EVALUATED FOR A  
POSSIBLE TRAINING PROGRAM IN AVIATION UNDERWATER  
SURVIVAL. STANDARD NAVAL AVIATION OXYGEN EQUIPMENT  
WAS INSTALLED IN A DILBERT DUNKER AND AS A  
PORTABLE INSTALLATION FOR TRAINING PURPOSES. IN  
ADDITION, DIVING EQUIPMENT WAS MADE FOR A 'SAFETY  
DIVER.' ALL APPARATUS OPERATED SUCCESSFULLY.  
INSTALLATION AND EVALUATION IS DETAILED IN THE  
REPORT. EQUIPMENT AND PERSONNEL REQUIRED FOR  
OPERATION OF THE APPARATUS, AS WELL AS A SAMPLE  
LECTURE ARE INCLUDED IN THE REPORT. (AUTHUR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-622 160  
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN

THE DEVELOPMENT OF METHODS FOR THE SELECTION OF SOUND  
LISTENING PERSONNEL. (U)

MAR 42 11P SHILLING, C. W. ;  
REPT. NO. NMRL-1

UNCLASSIFIED REPORT

DESCRIPTIONS: (•SUBMARINE PERSONNEL, SELECTION),  
(•UNDERWATER SOUND EQUIPMENT,  
OPERATORS(PERSONNEL)), (•OPERATORS(PERSONNEL),  
SELECTION), AUDITORY ACUITY, NOISE, ACOUSTIC  
EQUIPMENT, PITCH DISCRIMINATION,  
PERFORMANCE(HUMAN), AUDIO PERCEPTION, APTITUDE  
TESTS, NAVAL TRAINING, NAVAL PERSONNEL  
IDENTIFIERS: PERSONNEL SCREENING TESTS (U)

EARLY IN 1939 KUHR WAS UNDERTAKEN TO DETERMINE THE  
EFFECT UPON AUDITORY ACUITY OF SOME OF THE HAZARDS  
ENCOUNTERED IN THE COURSE OF SUBMARINE DUTY. IT  
SEEMED LIKELY THAT THERE MIGHT BE A DETRIMENTAL  
EFFECT UPON HEARING FOLLOWING EXPOSURE TO CONDITIONS  
SUCH AS THE CONTINUOUS RUAR OF DIESEL ENGINES, THE  
NOISE OF GUNPIPE, AND THE MECHANICAL TRAUMA OF HIGH  
PRESSURE AIR, AS IN DEEP-SEA DIVING AND LUNG  
TRAINING. DETAILED REPORTS OF THE RESULTS OF THIS  
WORK ARE BEING PUBLISHED IN THE U.S. NAVY MEDICAL  
BULLETIN, THE FIRST SECTION HAVING APPEARED IN THE  
JANUARY 1942 NUMBER. IN THE COURSE OF THIS STUDY  
IT WAS NOTED THAT MANY OF THE MEN ENGAGED AS SOUND  
OPERATORS FAILED TO MEASURE UP TO THE AUDITORY  
REQUIREMENTS OF THE MANUAL OF THE MEDICAL  
DEPARTMENT, CHAPTER III, ARTICLE 1535 (D-3).  
ALTHOUGH THESE SAME MEN APPARENTLY WERE CAPABLE  
OPERATORS OF SOUND DETECTION EQUIPMENT. THIS LED  
US TO QUESTION THE USE OF THE AUDIOTGRAM AS THE SOLE  
MEANS OF SELECTING SOUND OPERATORS. AN ATTEMPT WAS  
THEREFORE MADE TO DISCOVER TESTS WHICH MIGHT BETTER  
SERVE THIS PURPOSE. (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-624 /53 6/14 13/10  
NAVAL SUBMARINE MEDICAL CENTER GROTON CONN

AUDITORY FATIGUE UNDERWATER AT 1900 CYCLES PER SECUND. (U)

DESCRIPTIVE NOTE: MEMO. REPT.,  
JUL 65 SP SMITH,PAUL F.;  
REPT. NO. 65-9  
PROJ: MRUUS-14-1200  
MONITOR: NAVMED, MRU04-14-1200-05

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTIONS: (\*FATIGUE(PHYSIOLOGY), UNDERWATER SOUND), (\*UNDERWATER SOUND, FATIGUE(PHYSIOLOGY)), AUDIOFREQUENCY, UNDERWATER SOUND SIGNALS, DIVING, UNDERWATER CLOTHING, SONAR EQUIPMENT, TRANSDUCERS, THRESHOLDS(PHYSIOLOGY) (U)

THE OBJECTIVE OF THE RESEARCH WAS TO DETERMINE WHETHER OR NOT DIVERS MAY SAFELY BE EXPOSED TO INTENSE UNDERWATER SIGNALS AT 1900 CYCLES PER SECOND. IT WAS FOUND THAT DIVERS WEARING STANDARD WET SUITS WITH HOODS CAN SAFELY ENTER THE WATER IN THE PRESENCE OF SIGNALS UP TO 1900 CYCLES PER SECOND AT SIGNAL LEVEL AT LEAST UP TO 169 DECIBELS RE .0002 MICROBAR (95 DB RE 1 MICROBAR) AND REMAIN AT LEAST 30 MINUTES, UNDER CONDITIONS OF PULSE LENGTH AND DUTY CYCLE SIMILAR TO THOSE USED IN THIS STUDY. THIS INFORMATION WILL EVENTUALLY BE USEFUL IN ESTABLISHING SAFE WORKING DISTANCES FOR NAVY DIVERS FROM SONAR TRANSDUCERS TRANSMITTING AT 1900 CYCLES PER SECOND. MORE INTENSE LEVELS WOULD BE NECESSARY TO ESTABLISH A DAMAGE RISK CRITERION. (AUTHOR) (U)

UNCLASSIFIED

UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-624 760 6/14 13/10  
NAVAL SUBMARINE MEDICAL CENTER GROTON CONNECTICUT

NOISE SURVEY OF ENGINE ROOMS OF U.S.S. TRINGA. (U)

DESCRIPTIVE NOTE: MEMORANDUM REPT.,  
MAY 65 OR MARKIS, J. DONALD; NAUMOFF, N.  
S. N.:  
REPT. NO. MR-65-U  
MONITOR: NAVMED. MR005-14-1200-2-03

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTIONS: ((SUBMARINES, NOISE), (NOISE,  
SUBMARINE ENGINES), MILITARY MEDICINE, SUBMARINE  
PERSONNEL, TOLERANCE) (PHYSIOLOGY),  
THRESHOLDS (PHYSIOLOGY)) (U)

NOISE SURVEY OF ENGINE ROOMS OF U.S.S. TRINGA.

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UNCLASSIFIED

/ZHK23

UNCLASSIFIED

UDC REFURB BIBLIOGRAPHY SEARCH CONTROL NU. /ZHK23

AU-63U 510 5/9  
DUNLAP AND ASSOCIATES INC DARIEN CONN

STUDIES OF DIVERS' PERFORMANCE DURING THE SEALAB II PROJECT. (U)

DESCRIPTIVE NOTE: FINAL REPT. MAR 66,  
MAR 66 S&P BOWEN, HUGH M.; ANDERSEN,  
BIRGER; PROMISEL, DAVID;  
REPT. NU. SSU-66-296(S7);  
CONTRACT: NONR-4930(UO)

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (DIVING, PERFORMANCE TESTS),  
UNDERWATER, PERSONNEL, PERFORMANCE(HUMAN),  
PSYCHOMOTOR TESTS, PSYCHOMETRICS, UNDERWATER EQUIPMENT (U)

IDENTIFIERS: SEALAB PROJECT (U)

FIELD STUDIES OF THE THREE 10 MEN TEAMS OF DIVERS PARTICIPATING IN THE SEALAB II PROJECT WERE UNDERTAKEN. DURING EACH TEAM'S 15 DAY SURMERGENCE AT 205 FEET, PSYCHOMOTOR TESTS AND A VISION TEST WERE CONDUCTED IN THE WATER, AND A MENTAL ARITHMETIC TEST IN THE HABITAT. COMPARED TO BASE LINE PERFORMANCE (URY-LAND AND SHALLOW WATER CONDITIONS), PERFORMANCE ON THE MENTAL ARITHMETIC TEST SHOWED NO DETERIORATION WHILE PERFORMANCE ON THE PSYCHOMOTOR TESTS SHOWED CONSIDERABLE DETERIORATION. MANY DIVERS FOUND THAT THEIR IN-WATER ACTIVITIES PROCEEDED SLOWLY; AMONG OTHER CAUSES OF A MORE PHYSICAL NATURE, CONCERN FOR ONE'S SAFETY MAY DETRACT FROM THE AMOUNT OF ATTENTION ONE GIVES TO THE TASK AT HAND. THE MOST ACTIVE DIVERS IN THE SEALAB GROUP WERE THOSE WHO INDICATED THAT THEY WERE LEAST FEARFUL AND LEAST AROUSED BY THE CONDITIONS AND WHO WERE HELPFUL, GREGARIOUS, AND MADE LEAST TELEPHONE CONTACT WITH THE OUTSIDE WORLD. (AUTHOR) (U)

UNCLASSIFIED

DDL REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-635 650 13/10.1 6/11 8/1  
NAVAL SUBMARINE MEDICAL CENTER GRUTIN CONN

SEALAB I: A PERSONAL DOCUMENTARY ACCOUNT. (U)

DESCRIPTIVE NOTE: MEMORANDUM REPT.  
MAK 66 41P THOMPSON, ROBERT E. I  
REPT. NO. MR-66-Y,  
MONITOR: NAVMED MF011.99-9003.05

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTIONS: (+NAVAL RESEARCH, +UNDERWATER), NAVAL PERSONNEL, LIFE SUPPORT, UNDERWATER VEHICLES, CONFINED ENVIRONMENTS, MARINE BIOLOGY, FISHES, BEHAVIOR, OCEANOGRAPHIC DATA, DECOMPRESSION, UNDERWATER EQUIPMENT (U)

IDENTIFIERS: SEALAB (U)

THE AUTHOR WAS THE MEDICAL OFFICER PARTICIPANT IN THE GROUP OF FOUR MEN WHO SPENT TEN DAYS IN THE UNDERWATER HABITATION DESIGNATED SEALAB I IN JULY-AUGUST 1964. THIS IS A DAY BY DAY ACCOUNT OF THE EXPERIENCES AND PROBLEMS ENCOUNTERED BY THE AUTHOR DURING THE PREPARATION FOR THE EXPERIENCES AND PROBLEMS ENCOUNTERED BY THE AUTHOR DURING THE PREPARATION FOR THE EXPERIMENT, BEGINNING ON 28 APRIL, AND DURING THE ACTUAL TIME UNDERWATER AND DURING THE ASCENT TO THE SURFACE AND THE PERIOD OF DECOMPRESSION, TERMINATING ON THE FIRST OF AUGUST. THIS PARTICULAR SUBMARINE-QUALIFIED MEDICAL OFFICER WAS CHOSEN FOR THIS ASSIGNMENT IN THE SEALAB I PROJECT BECAUSE OF HIS PREVIOUS TRAINING IN THE FIELDS OF MARINE BIOLOGY AND DIVING MEDICINE. THIS PERSONAL ACCOUNT IS PUBLISHED AT THIS TIME AS A PART OF THE RECORD OF THE SEALAB SERIES OF PROJECTS, WHICH ARE PART OF THE LARGER MAN-IN-THE-SEA PROGRAM. HE DESCRIBES WHAT THEY ATE, HOW THEY SLEPT, DETAILS OF THEIR SORTIES INTO THE OCEAN AROUND THEM; PROBLEMS DUE TO CONTAMINATION OF THEIR ATMOSPHERE; THE FISH AND MARINE LIFE OBSERVED THROUGH THEIR PORTHOLES OR ENCOUNTERED IN THEIR EXCURSIONS OUTSIDE THE SEALAB; AS WELL AS THEIR PSYCHOLOGICAL STATES, THEIR RELATIONSHIPS WITH EACH OTHER, AND THEIR COMMUNICATIONS WITH BOTH THE SUPPORT PERSONNEL UPSIDE AND THEIR FAMILIES AT HOME. (AUTHOR) (U)

UNCLASSIFIED

DDC REFURT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-630 521 S/9 6//  
NAVAL PERSONNEL PROGRAM SUPPORT ACTIVITY WASHINGTON D C  
PERSONNEL RESEARCH LAB

A PRELIMINARY STUDY OF PERSONNEL AND TRAINING  
REQUIREMENTS FOR DEEP SUBMERGENCE RESCUE VEHICLES  
(DSRV). (U)

JUN 66 45P FROST, A. S., JR.  
REPT. NU. NRM-66-03,  
PROJ: SQ46-15,  
TASK: J.

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTIONS: (+SUBMARINE PERSONNEL, +NAVAL  
TRAINING), (+SEA RESCUE EQUIPMENT, +DEEP  
SUBMERGENCE), MAINTENANCE PERSONNEL,  
OPERATORS(PERSONNEL), SUBMARINE ESCAPE,  
SUBMARINES (U)

A REVIEW OF PROPOSED EQUIPMENTS FOR THE SYSTEM  
INDICATES A REQUIREMENT FOR HIGHLY SKILLED AND  
EXPERIENCED OPERATOR/MAINTENANCE PERSONNEL. IN  
PARTICULAR, THE DSRV OPERATOR/MAINTENANCE CREW WILL  
REQUIRE HIGHLY SKILLED SUBMARINE QUALIFIED PERSONNEL.  
THE REPORT INCLUDES A DESCRIPTION OF SYSTEM DESIGN  
AND SUPPORT REQUIREMENTS AND CONTAINS ESTIMATES OF  
PERSONNEL AND TRAINING REQUIREMENTS FOR MANNING THE  
SYSTEM. (AUTHOR) (U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AB-630 151 5/9  
NAVAL MEDICAL RESEARCH LAB NEA LONDON CONN

PRELIMINARY ANALYSIS OF THE NEA LONDON SUBMARINE  
PERFORMANCE REPORTS.

(U)

DEC 43 SP GANTLETT, NEIL H. ;  
REPT. NO. NMRL-21

UNCLASSIFIED REPORT

DESCRIPTIONS: (SUBMARINE PERSONNEL, SELECTION,  
PERFORMANCE(HUMAN), CORRELATION TECHNIQUES

(U)

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/ZHK23

UNCLASSIFIED

UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-638 163 6/16  
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN

FIELD TEST OF DARK ADAPTATION OF DIVERS. (U)

DESCRIPTIVE NOTE: REPT. NO. 1(FINAL).  
JUL 46 16P EVERLEY, J. A.; KENNEDY, WM. S.  
REPT. NO. NMRL-166  
PROJ: NAVMED-X-663

UNCLASSIFIED REPORT

DESCRIPTORS: (VISION, ADAPTATION(PHYSIOLOGY)),  
(DIVING, VISION), NAVAL PERSONNEL, VISUAL  
ACUITY, ILLUMINATION, EYEGLASSES, HELMETS,  
OXYGEN, METEOROLOGICAL PARAMETERS (U)

DATA ARE PRESENTED ON 120 DIVES IN WATER OF A DEPTH  
OF 15 TO 18 FEET IN WHICH THE BOTTOM WAS VERY MUDDY  
AND TIDE AND CURRENT CONDITIONS SUCH AS TO MAKE THE  
ADVANTAGES OF DARK ADAPTATION DIFFICULT TO MEASURE.  
SUBJECTIVE IMPROVEMENT, HOWEVER, WAS REPORTED BY  
ALL 60 DIVERS. DATA ARE PRESENTED ON 42 DIVES IN  
170 FEET OF WATER HALF OF WHICH WERE BY DARK-ADAPTED  
DIVERS WHO SHOWED DEFINITELY MEASUREABLE IMPROVEMENT  
IN VISION AND WHO UNIVERSALLY EXPRESSED THEIR OPINION  
THAT DARK ADAPTATION IMPROVED UNDERWATER VISION  
MARKEDLY. PRELIMINARY EXPERIMENTS OF ROD AND CONE  
FUNCTION UNDER VARYING DEGREES OF ILLUMINATION AND OF  
OXYGEN TENSION ARE REPORTED. THE ADVANTAGES OF  
DARK ADAPTING DIVERS IS MORE EVIDENT ON DAYS IN WHICH  
METEOROLOGICAL AND OTHER CONDITIONS ARE SUCH AS TO  
PROVIDE LOW ILLUMINATION ON THE BOTTOM; THAT IS, ON  
DAYS DURING WHICH THE SUN IS PARTIALLY OR COMPLETELY  
OBSCURED. THE PRACTICABILITY OF DARK ADAPTING  
DIVERS BY DARK ADAPTATION GOGGLES WORN UNTIL THE  
DIVER WAS "IN BOTTOM" HAS BEEN DEMONSTRATED. IT HAS  
FOUND THAT UNCE DARK-ADAPTED, A DIVER'S VISION WILL  
REMAIN CONSTANT UNLESS RADICAL CHANGE IN LIGHT  
INTENSITY OCCURS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-638 400 S/9 5/10  
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN

FUNCTIONS OF LOUDNESS DISCRIMINATION IN SUBMARINE SONAR OPERATIONS. (U)

DESCRIPTIVE NOTE: REPT. NO. 1 UN PROJECT.  
APR 45 3YP HARRIS, J. DONALD;  
REPT. NO. NMNL-57  
PROJ: NAVMED-X-53

UNCLASSIFIED REPORT

DESCRIPTORS: (SONAR PERSONNEL, SELECTION),  
(PERFORMANCE TESTS, SONAR PERSONNEL), SONAR,  
PITCH DISCRIMINATION, PSYCHOACOUSTICS, SUBMARINE  
PERSONNEL, THRESHOLDS (PHYSIOLOGY), AUDITORY  
ACUITY (U)

A RESUME IS GIVEN OF THE RESEARCH ON THE  
RELATIONSHIP OF PURE-TONE LOUDNESS DISCRIMINATION TO  
THE SUBMARINE SONAR PERFORMANCE. THE EXPERIENCE OF  
THE LABORATORY SINCE JULY 1944 WITH AUDITORY  
TEST NO. 7 OF THE HARVARD PSYCHO-AUDIOLOGIC  
LABORATORY, "LOUDNESS DISCRIMINATION FOR  
BANDS OF NOISE" IS PRESENTED. THIS TEST, WHICH  
REQUIRES A SUBJECT TO MAKE 110 JUDGMENTS AS TO  
WHETHER A COMPLEX TUNE (500-2000 C.P.S.) BECOMES  
LOUDER OR SOFTER IN INTENSITY, IS SATISFACTORILY  
RELIABLE WHEN ADMINISTERED AS A GROUP TEST WITH  
LOUDSPEAKER (ODD-EVEN R = +.88). PERFORMANCE  
ON THE TEST IS INDEPENDENT OF OVERALL INTENSITY LEVEL  
OVER A RATHER WIDE RANGE. THE RELATION OF THE TEST  
TO SONAR PERFORMANCE IS INVESTIGATED IN PRELIMINARY  
EXPERIMENTS. NO CORRELATION EXISTS BETWEEN THE  
TEST AND FINAL SOUND SIGNAL GRADES; BUT WHEN  
CORRELATED AGAINST SPECIFIC AUDITORY SONAR  
PERFORMANCES TO WHICH LOUDNESS DISCRIMINATION MAY  
REASONABLY BE PRESUMED TO CONTRIBUTE, CORRELATIONS OF  
THE ORDER .21 = .51 WERE OBTAINED. IN ADDITION,  
SIGNIFICANT DIFFERENCES IN PERFORMANCE WERE FOUND  
BETWEEN THOSE WHO DO POORLY AND THOSE WHO DO AVERAGE  
OR BETTER ON THE TEST. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-639 624 5/5 5/8  
PSYCHOLOGICAL CORP NEW YORK

THE USE OF HUMAN ENGINEERING DATA IN EQUIPMENT DESIGN PROBLEMS. (U)

SEP 59 33P COAKLEY, JOHN D. ;  
CONTRACT: N6URI-151(U) ;  
PROJ: 20-F-2,  
MONITOR: NAVTRADEVEN 151-1-16

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTIONS: (HUMAN ENGINEERING, MAN-MACHINE SYSTEMS), DESIGN, MACHINES, OPERATIONS RESEARCH, CONTROL SYSTEMS, DISPLAY SYSTEMS, SUBMARINES (U)

THE PURPOSE OF THE REPORT IS TO CITE EXAMPLES OF DESIGN PROBLEMS WHICH ARE TYPICAL OF THOSE ENCOUNTERED IN CONSULTING WORK. THE MANNER IN WHICH RECOMMENDATIONS ARE DERIVED BY RECONCILING PERTINENT EXPERIMENTAL DATA WITH THE SPECIFIC REQUIREMENTS OF THE EQUIPMENT IS DISCUSSED. THE CASES CITED ILLUSTRATE THE VARIOUS DEGREES OF CONFIDENCE WITH WHICH RECOMMENDATIONS ARE MADE, AND POINT UP THE AREAS IN WHICH FURTHER RESEARCH IS NEEDED. THE EXAMPLES ARE GATHERED FROM STUDIES OF EQUIPMENT DESIGNED FOR USE ABOARD SUBMARINES. HOWEVER, THE PROBLEMS ENCOUNTERED AND THE METHOD OF APPROACH ARE PROBABLY TYPICAL OF LARGE AREAS IN THE FIELD OF APPLIED HUMAN ENGINEERING. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-639 170 15/10.1  
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN

MINIMAL RED LIGHT LEVELS ON BOARD SUBMARINES. (U)

DESCRIPTIVE NOTE: MEMO REPT.  
JAH GU SP DILLMICK, FORREST L. ;  
REPT. NU. MR-60-2,  
MONITOR: NAVMED MK005.14-1100.06

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTIONS: (SUBMARINES, LIGHTING EQUIPMENT),  
(SUBMARINE PERSONNEL, VISUAL ACUITY),  
ADAPTATION(PHYSIOLOGY), VISION, COLORS,  
BRIGHTNESS (U)

SPECIFIC LIMITING BRIGHTNESS VALUES WERE DETERMINED  
FOR LIGHT SOURCES AND WORKING SURFACES FOR SUBMARINE  
COMPARTMENTS WHERE RED LIGHTING IS REQUIRED, IN ORDER  
TO PROVIDE ADEQUATE SEEING CONDITIONS UNDER RED LIGHT  
WITH MINIMUM INTERFERENCE TO DARK-ADAPTED PERSONNEL.  
SINCE ACUITY DECREASES AS THE LEVEL OF ILLUMINATION  
IS LOWERED, WHEREAS DARK ADAPTATION INCREASES, ANY  
SPECIFICATIONS OF BRIGHTNESS LEVELS CAN BE NO MORE  
THAN A WORKABLE COMPROMISE BETWEEN THE TWO  
REQUIREMENTS. ACCORDINGLY, INITIAL ADAPTATION  
SHOULD BE MADE UNDER THE BEST POSSIBLE CONDITIONS,  
THAT IS UNDER THE LOWEST FEASIBLE RED ILLUMINATION  
WHEREIN THE MEN CAN PERFORM NECESSARY TASKS. (U)

UNCLASSIFIED

UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-635 625 6/19 5/9  
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN

OBSERVATIONS ON EFFICIENCY OF SUBMARINE PERSONNEL  
DURING Prolonged SUBMERSION WHEN THE ATMOSPHERIC  
OXYGEN IS MAINTAINED AT 17% AND THE CARBON DIOXIDE AT  
3%. (U)

DESCRIPTIVE NOTE: FINAL REPT.,  
JUL 45 SIP KARLIN, J. E. & CURTIS, J. F.;  
REPT. NO. NMRL-7U  
PROJ: NAVMED-X-516

UNCLASSIFIED REPORT

DESCRIPTORS: (\*STRESS(PHYSIOLOGY), SUBMARINE  
PERSONNEL), (\*SUBMARINE PERSONNEL,  
PERFORMANCE(HUMAN)), (\*RESPIRATION, SUBMARINE  
PERSONNEL), OXYGEN, CARBON DIOXIDE, PHYSICAL  
FITNESS, VISUAL PERCEPTION, VOICE COMMUNICATION  
SYSTEMS, CLOSED ECOLOGICAL SYSTEMS, VISUAL  
PERCEPTION, RADAR OPERATORS, SONAR PERSONNEL,  
HEARING, SPEECH, MEMORY, COLOR VISION,  
ATTENTION, TESTS (U)

THE PURPOSE OF THIS INVESTIGATION WAS TO DETERMINE  
WHETHER THE OPERATING EFFICIENCY OF SUBMARINE  
PERSONNEL DETERIORATED DURING SUBMERSION WHEN THE  
ATMOSPHERIC OXYGEN WAS MAINTAINED AT 17% AND THE  
CARBON DIOXIDE AT 3% FOR EXTENDED PERIODS. THE  
RESULTS OF THE OBSERVATIONS SHOW: (A) VERY  
DEFINITELY DECREASED CAPACITY FOR PHYSICAL WORK FOR  
ALL HANDS. (B) VERY DEFINITE DECREASE IN  
EFFICIENCY OF NIGHT VISION FOR ABOUT ONE THIRD OF THE  
SHIP'S COMPANY. (C) INDICATIONS OF MARKED  
DECREMENT IN MENTAL EFFICIENCY FOR ALL HANDS. (D)  
VERY PROBABLE DECREASE IN EFFICIENCY OF INTERIOR  
VOICE COMMUNICATIONS. (E) NOTICEABLE, BUT  
UNPROVEN, TENDENCY TOWARDS GENERAL DECREASE IN  
EFFICIENCY OF RADAR WATCH AND WATCH ON THE BOW AND  
STERN PLANES. (F) NO INDICATION OF DETERIORATION  
IN STRAIGHTFORWARD LISTENING PERFORMANCE FOR SONAR  
SIGNALS. (G) NO RELIABLE EVIDENCE EITHER ON  
EFFICIENCY IN WATCHING THE 'CHRISTMAS TREE' OR  
MEMORY FOR NUMBERS. (U)

UNCLASSIFIED

UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-641 361 17/1 13/12  
NAVY MINE DEFENSE LAB PANAMA CITY FLA

THE DEVELOPMENT OF A SWIMMER TRACKING DEVICE. (U)

DESCRIPTIVE NOTE: INTENR. REPT., JUL 65-JAN 66,  
LCT 66 24P MULLEN, R. W.;  
REPT. NO. I-108  
PROJ: SF-011-06-U3  
TASK: 11507

UNCLASSIFIED REPORT

DESCRIPTIONS: (SWIMMING, UNDERWATER TRACKING),  
(UNDERWATER TRACKING, ACOUSTIC EQUIPMENT),  
(DIVING, SAFETY DEVICES), SONAR RECEIVERS,  
TRANSISTORS, OSCILLATORS, TRANSDUCERS, NAVAL  
TRAINING (U)

A SWIMMER TRACKING DEVICE CONSISTING OF ACOUSTIC  
MARKERS AND A RECEIVER HAS BEEN DEVELOPED BY THE U.  
S. NAVY MINE DEFENSE LABORATORY TO PROVIDE A  
MEANS OF TRACKING NAVY SWIMMERS DURING TRAINING  
EXERCISES. THE ACOUSTIC MARKERS ARE TUNABLE FROM  
29 KHZ (KILOHERTZ, KILOCYCLES PER SECUND) TO 45  
KHZ AND MAY BE MANUALLY SWITCHED BETWEEN CONTINUOUS  
WAVE (CW) AND PULSE MODES OF OPERATION. THE  
RECEIVER IS A MARK 16 MOD 0 SONAR RECEIVER  
MODIFIED TO IMPROVE ITS SELECTIVITY AND IMAGE  
REJECTION. WITH THE MODIFIED RECEIVER LOCATED ON A  
SAFETY BOAT, THE BEARINGS TO MARKERS LOCATED ON  
SWIMMERS CAN BE DETERMINED, AND THEY CAN BE  
IDENTIFIED BY THEIR MARKER FREQUENCIES. AS MANY AS  
SEVENTEEN SWIMMER PAIRS CAN BE TRACKED, EVEN AT  
DISTANCES EXCEEDING 1000 YARDS. (AUTHOR) (U)

UNCLASSIFIED

UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-642 134 13/10.1 5/5 17/8  
PSYCHOLOGICAL CORP NEW YORK

THE HUMAN FACTOR IN THE DESIGN AND LAYOUT OF  
SUBMARINE EQUIPMENT. THE KOLLMORGEN ANY-HEIGHT  
PERISCOPE. (U)

DESCRIPTIVE NOTE: PROGRESS REPT. NO. 9,  
FEB 48 BY TOLCOTT, MARTIN A., CHANNELL,  
RALPH C.;

CONTRACT: N6URI-1511011

PROJ: SPECDEVCE-2U-F-2

MONITOR: SPELDEVCFN 151-1-7

UNCLASSIFIED REPORT

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DESCRIPTIONS: (\*SUBMARINE PERISCOPE, \*HUMAN  
ENGINEERING), DESIGN, SUBMARINES, CONTROL KNOBS (U)

THE SPECIFICATIONS FOR THE SUBMARINE ATTACK  
PERISCOPE, FIXED EYE PIECE TYPE (TYPE VI), WERE  
EXAMINED. PARTICULAR ATTENTION HAS BEEN GIVEN TO  
THE CONTROLS AND DISPLAYS FROM THE STANDPOINT OF  
HUMAN OPERATION. THE REPORT PRESENTS, FOR THE MOST  
PART, COMMENTS ABOUT EACH CONTROL AND INDICATOR, AND  
A RUUGH SKETCH IS INCLUDED INDICATING ONE POSSIBLE  
ARRANGEMENT. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AD-642 730 13/10.1 5/5  
PSYCHOLOGICAL CORP NEW YORK

THE HUMAN FACTOR IN THE DESIGN AND LAYOUT OF  
SUBMARINE EQUIPMENT: ANALYSIS OF EQUIPMENT RATINGS  
AND PROPOSED LAYOUT OF SUBMARINE ATTACK CENTER. (U)

DESCRIPTIVE NOTE: PROGRESS REPT. NO. 8,  
NOV 47 ZIP CHANNEL, RALPH C. TOLCOTT,  
MARTIN A. ;  
CONTRACT: N60RI-151(U)1  
MONITOR: SPECDEVCH 151-1-6

UNCLASSIFIED REPORT

Reproduced from  
best available copy.

DESCRIPTIONS: (•SUBMARINES, •HUMAN ENGINEERING),  
SUBMARINE PERSONNEL, OFFICER PERSONNEL, UNDERSEA  
WARFARE (U)

AS PART OF THE PROJECT TO DETERMINE THE OPTIMAL  
ARRANGEMENT OF EQUIPMENT IN THE ATTACK CENTER OF THE  
NEWLY DESIGNED SUBMARINE, OFFICERS WERE REQUESTED TO  
RANK VARIOUS PIECES OF EQUIPMENT IN ORDER OF  
IMPORTANCE TO THEM DURING THE APPROACH AND ATTACK  
PHASES OF A SUBMERGED ATTACK. THESE RANKINGS WERE  
MADE FROM THE POINTS OF VIEW OF FOUR DIFFERENT  
OFFICERS: ATTACK OFFICERS, FIRE CONTROL  
OFFICERS, ANALYZER OPERATORS AND POSITION  
KEEPER OPERATORS. ON THE BASIS OF THE OBTAINED  
RANKINGS A PRELIMINARY PLAN WAS DEVELOPED FOR  
ARRANGING THE EQUIPMENT TO SUIT THE REQUIREMENTS OF  
THESE OFFICERS. IT IS RECOGNIZED THAT COMPROMISES  
WILL BE NECESSARY DUE TO CERTAIN ENGINEERING  
REQUIREMENTS. THE LOCATION OF SOME GEAR WAS  
ALREADY DETERMINED IN ACCORDANCE WITH THESE  
REQUIREMENTS, AND THE PLACEMENT OF OTHER GEAR MAY BE  
AFFECTED BY THE PREVIOUS INSTALLATION OF CABLES,  
PIPES, BEAMS, ETC. (AUTHOR) (U)

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UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-642 135 13/10.1 S/5 17/8  
PSYCHOLOGICAL CORP NEW YORK

THE HUMAN FACTOR IN THE DESIGN AND LAYOUT OF  
SUBMARINE EQUIPMENT, KULLMOKEN ANY HEIGHT PERISCOPE,  
HUMAN FACTORS IN THE OPERATION OF. (U)

UCL 47 SP  
CONTRACT: N6URI-151(U)  
MONITOR: SPECDEVLEN 151-1-5

UNCLASSIFIED REPORT

DESCRIPTORS: (•)SUBMARINE PERISCOPE, •HUMAN  
ENGINEERING, DESIGN, SUBMARINES, OPERATION,  
CONTROL KNOBS, DISPLAY SYSTEMS (U)

THE CONTROLS AND DISPLAYS WERE CONSIDERED WITH  
REFERENCE TO SIZE, SHAPE, LOCATION, VISIBILITY, EASE  
OF MANIPULATION, AND OTHER FACTORS ESSENTIAL FOR  
MAXIMAL EFFICIENCY OF OPERATION. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-644 737 13/10.1 S/S  
PSYCHOLOGICAL CAMP NEW YORK

THE HUMAN FACTOR IN THE DESIGN AND LAYOUT OF  
SUBMARINE EQUIPMENT: ANALYSIS OF BAR PATROL REPORTS  
AND INTERVIEWS. (U)

DESCRIPTIVE NOTE: PROGRESS REPT. NO. 6,  
SEP 47 24P TULCOTT, MARTIN A.; CHANNELL,  
RALPH C.;  
CONTRACT: N6URI-151(U)1  
MONITOR: SPECDEVEN 151-1-4

UNCLASSIFIED REPORT

DESCRIPTIONS: (\*SUBMARINES, \*HUMAN ENGINEERING),  
SUBMARINE PERSONNEL, DESIGN, CONTROL SYSTEMS,  
DISPLAY SYSTEMS (U)

PERTINENT COMMENTS ON THE FOLLOWING ASPECTS OF THE  
MAN-MACHINE RELATIONSHIP ARE SUMMARIZED: (A)  
MODIFICATIONS OF CURRENT EQUIPMENT TO SIMPLIFY  
PERCEPTION OF DISPLAYS AND OPERATION OF CONTROLS.  
(B) LOCATION OF EQUIPMENT FOR MOST EFFICIENT  
OPERATIONS. (C) PROBLEMS OF INTRA-CRAFT AND  
INTER-CRAFT COMMUNICATION. (D) RECOMMENDED FIRE  
CONTROL PROCEDURES. (E) EXAMPLES OF MECHANICAL  
AND HUMAN ERRORS. (F) TRAINING OF PERSONNEL.  
(G) PROBLEMS OF HEALTH, FATIGUE AND MORALE.  
(H) REQUESTS FOR NEW EQUIPMENT. (AUTHUR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-642 738 13/10  
DULAP AND ASSOCIATES INC STAMFORD CONN

HUMAN FACTORS IN THE DESIGN OF THE SUBMARINE DIVING  
CONTROL STATION.

(U)

DESCRIPTIVE NOTE: INTERIM REPT.,  
UCT 48 3SP TRABOLD, FREDERICK W. I  
TOLCOTT, MARTIN A. CHANNELL, RALPH C. I  
CONTRACT: NBUNR-641(U1)  
PROJ: SPECDEVVCEN-20-F-5  
MONITOR: SPECDEVVCEN 641-1-1

UNCLASSIFIED REPORT

DESCRIPTIONS: (\*SUBMARINES, DIVING), (\*DIVING,  
CONTROL PANELS), SUBMARINE PERSONNEL, HUMAN  
ENGINEERING, INDICATOR LIGHTS, DEPTH INDICATORS,  
DISPLAY SYSTEMS, TRAINING DEVICES, UNDERWATER  
VEHICLES, MARINE ENGINEERING

(U)

THE PURPOSES OF THE STUDY WERE TO: MAKE A  
FUNCTIONAL ANALYSIS OF THE DIVING STATION TRAINER;  
COMPARE OPERATIONS OF CONTROLS ABOARD SHIP WITH  
OPERATIONS OF THE TRAINER CONTROLS; INTERVIEW DIVING  
OFFICERS AND PLANESEN TO OBTAIN SUPPLEMENTARY  
INFORMATION AND TO EXCHANGE VIEWS ON RE-DESIGNING OF  
DISPLAYS; DEVELOP AND SUBMIT RECOMMENDATIONS FOR  
MODIFICATION OF THE TRAINER DISPLAYS; PROVIDE  
ENGINEERING ADVICE WITH RESPECT TO THE CONSTRUCTION  
OF THE MODIFIED EQUIPMENT; AND EVALUATE THE MODIFIED  
EQUIPMENT AFTER INSTALLATION ON THE TRAINER. (U)

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/ZHK23

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AD-644 734 13/10 5/9  
DUNLAP AND ASSOCIATES INC STAMFORD CONN

PERFORMANCE OF CONTROLLERMEN IN THE PROPULSION  
CUBICLE OF GUPPY SUBMARINES.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
JUN 44 62P COAKLEY, JOHN D. (THABOLD,  
FREDERICK W. SCHANNELL, RALPH C.);  
CONTRACT: N80NR-641(U2)  
PROJ: SPECDEVLEN-2U-F-2, NR-784-002  
MONITUR. SPECDEVLEN 641-2-1

UNCLASSIFIED REPORT

DESCRIPTIONS: (+SUBMARINES, MANEUVERABILITY),  
(+SUBMARINE PERSONNEL, PSYCHOMETRICS), MARINE  
PROPULSION, CONTROL PANELS, HUMAN ENGINEERING,  
PERFORMANCE(HUMAN), UNDERWATER PROPULSION,  
TRAINING, PHOTOGRAPHIC ANALYSIS, DISPLAY SYSTEMS,  
HANDS (U)  
IDENTIFIERS: GUPPY (U)

THE PURPOSE OF THIS STUDY WAS TO DETERMINE IF THE  
APPLICATION OF HUMAN ENGINEERING PRINCIPLES COULD  
IMPROVE THE PERFORMANCE OF CONTROLLERMEN AND  
THROUGH SUCH IMPROVEMENT INCREASE THE MANEUVERABILITY  
OF THE SUBMARINE. THE FIRST STEP IN SUCH A STUDY  
WAS TO DESCRIBE AND EVALUATE THE PRESENT PERFORMANCE  
OF CONTROLLERMEN. AS A RESULT OF THIS  
EVALUATION, RECOMMENDATIONS HAVE BEEN MADE WHICH  
SHOULD RESULT IN IMPROVED SUBMARINE OPERATION. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 12HK23

AU-642 799 5/5 13/110.1  
DUNLAP AND ASSOCIATES INC STAMFORD CONN

## HUMAN FACTORS IN THE DESIGN OF THE SUBMARINE CONTROL ROOM. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
UCT 44 62P CHANNEL, RALPH C. ;  
CONTRACT: NBUNK-641(U2)  
PROJ: NH-784-002, SPECDEV CEN-20-F-2  
MONITOR: SPECDEV CEN 641-2-4

UNCLASSIFIED REPORT

**SUPPLEMENTARY NOTE: REPORT ON HUMAN ENGINEERING SYSTEMS STUDIES.**

**DESCRIPTORS:** (•SUBMARINES, •HUMAN ENGINEERING), DESIGN, CONTROL SYSTEMS, PERFORMANCE(HUMAN), SUBMARINE PERSONNEL, OPERATION

THE PURPOSE OF THIS REPORT IS TO MAKE RECOMMENDATIONS FOR IMPROVING THE DESIGN AND OPERATION OF THE CONTROL ROOM IN THE SS 563/564. THE EMPHASIS IS UPON THE GENERAL ARRANGEMENT OF EQUIPMENT AND PERSONNEL, ALTHOUGH CONTROLS AND INDICATORS ON PRESENT SUBMARINES ARE ALSO EVALUATED. WHERE PRESENT EQUIPMENT IS DUPLICATED IN THE SS 563/564, THE SPECIFIC CRITICISMS AND RECOMMENDATIONS APPLY DIRECTLY TO THE NEW SUBMARINES. (U)

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/ZMK23

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DDC REPORT BIBLIOGRAPHY SEARCH PUNTHOL NO. /ZMK23

AD-642 600 15/10.1 5/5 5/8  
DUNLAP AND ASSOCIATES INC STAMFORD CONN

MODIFICATION OF THE DESIGN OF VISUAL DISPLAYS IN THE  
MANEUVERING ROOM OF GUPPY SUBMARINES. (U)

DESCRIPTIVE NOTE: TECHNICAL MEMT.,  
SEP 49 46P OAKLEY, JOHN D.; THABOLD,  
FREDERICK W.; MCNAUL, RALPH C.;  
CONTRACT: NBUNR-641(U2)  
PROJ: NR-784-002, SPECDEV CEN-ZU-F-2  
MONITOR: SPECDEV CEN 641-2-3

UNCLASSIFIED REPORT

DESCRIPTORS: (SUBMARINES, HUMAN ENGINEERING),  
(DISPLAY SYSTEMS, DESIGN), VISUAL PERCEPTION,  
SUBMARINE PERSONNEL, CONTROL SYSTEMS (U)

FOR PURPOSES OF ANALYSIS, THE DISPLAYS WERE DIVIDED  
INTO TWO MAIN GROUPS: (A) INSTRUMENTS PROVIDING  
QUANTITATIVE INFORMATION OF PRIMARY IMPORTANCE TO THE  
CONTROLLERMAN, AND (B) ACCESSORY INSTRUMENTS  
PERMITTING FEW, IF ANY, QUANTITATIVE READINGS. THE  
ANALYSIS REVEALED THAT: (1) THERE ARE MANY  
VIOLATIONS OF THE GUIDING PRINCIPLES OF HUMAN  
ENGINEERING. (2) THE INSTRUMENTS HAVE NOT BEEN  
ORGANIZED INTO A SYSTEM OF DISPLAYS FROM WHICH THE  
OPERATOR MAY OBTAIN PRECISELY THE REQUIRED  
INFORMATION. (AUTHOR) (U)

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/ZMK23

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-642 835 6/11  
NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF

ENVIRONMENT CONTROL IN PRESSURIZED UNDERWATER  
HABITATS. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
NOV 66 3JP BECK, E. J.  
REPT. NO. NCEL-TK-490  
PROJ: Y-FU15-01-U99-003

UNCLASSIFIED REPORT

DESCRIPTORS: (\*CONTROLLED ATMOSPHERES, UNDERWATER),  
(\*UNDERWATER VEHICLES, LIFE SUPPORT), (\*UNDERWATER  
EQUIPMENT, LIFE SUPPORT), DIVING, DEEP  
SUBMERGENCE, CLOSED ECOLOGICAL SYSTEMS, OXYGEN  
EQUIPMENT, DECOMPRESSION SICKNESS, HEAT TRANSFER,  
SPEECH, HELIUM, PURIFICATION, WATER SUPPLIES,  
HEATING, SANITARY ENGINEERING, POWER SUPPLIES,  
FOOD (U)

IDENTIFIERS: UNDERWATER HABITATS, \*CLEAN  
ROOMS (U)

A STUDY WAS MADE TO IDENTIFY THOSE ENVIRONMENTAL  
FACTORS WHICH WOULD HAVE TO BE CONTROLLED IN ORDER  
THAT MAN COULD LIVE AND WORK BENEATH THE SEA. THE  
STATE OF THE ART OF UNDERSEA HABITATION IS DESCRIBED,  
LIMITATIONS AND AREAS OF POSSIBLE MAJOR IMPROVEMENTS  
ARE LISTED, AND POSSIBLE APPROACHES TO MAJOR  
IMPROVEMENTS ARE OUTLINED. THE DEVELOPMENTAL  
ROUTES SUGGESTED ARE AIMED AT REDUCING COST AND  
COMPLEXITY, ESTABLISHING MORE NORMAL ENVIRONMENTS,  
AND, ABOVE ALL, REDUCING THE HAZARDS OF WORKING IN  
THE OCEAN. ENVIRONMENTAL FACTORS CONSIDERED ARE  
ATMOSPHERE, SANITATION, FOOD STORAGE AND PREPARATION,  
HEATING, AND THE EFFECTS OF SPECIAL ATMOSPHERES ON  
VOICE COMMUNICATION. THE PECULIAR REQUIREMENTS FOR  
PROVIDING A TOLERABLE ATMOSPHERE AT ANY BUT THE  
SHALLOWEST DEPTHS HAVE, BY KNOWN APPROACHES, PRODUCED  
MAJOR CHANGES IN ALL OTHER AREAS. ALTHOUGH THE  
TREATMENT IN THIS REPORT IS FROM AN ENGINEERING  
STANDPOINT, THE PROBLEMS ARE LARGELY PHYSIOLOGICAL.  
AN EFFORT IS MADE TO DESCRIBE THE PROBLEM IN TERMS  
FAMILIAR TO ENGINEERS WORKING IN THE FIELD OF  
ENVIRONMENT CONTROL, ALTHOUGH SOME OF THE MORE  
IMPORTANT REFERENCES NECESSARILY OVERLAP INTO  
MEDICINE AND PHYSIOLOGY. (AUTHOR) (U)

UNCLASSIFIED

UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AD-643 115 13/10 19/8  
DUNLAP AND ASSOCIATES INC STAMFORD CT

A HUMAN ENGINEERING STUDY OF THE FORWARD TORPEDO ROOM  
IN THE SS 563/564 CLASS SUBMARINES. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
FEB 51 73P CASPERSON, H. J; CHANNELL, RALPH  
C. :  
CONTRACT: NBUNN-641(U2)  
PROJ: SPECDEV CEN-2U-F-2, NH-784-002  
MONITOR: SPELDEV CEN 641-2-11

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SUBMARINES, DESIGN), (\*TORPEDOES,  
FIRE CONTROL SYSTEMS), HUMAN ENGINEERING, CONTROL  
PANELS, OPERATORS(PERSONNEL), UNDERWATER  
PROJECTILES, POSITION FINDING, UNDERWATER EQUIPMENT,  
MINELAYING (U)

A HUMAN ENGINEERING STUDY HAS BEEN MADE OF THE  
FORWARD TORPEDO ROOM IN THE SS 563/564 CLASS SUBMARINE.  
THE MAJOR OBJECTIVES OF THIS STUDY WERE TO ANALYZE  
TORPEDO FIRING AND MINE PLANTING OPERATIONS AND TO  
DEVELOP RECOMMENDATIONS FOR THE IMPROVEMENT OF  
OVERALL EFFICIENCY IN THE TORPEDO ROOM.  
OBSERVATIONS OF TORPEDO ROOM ACTIVITY, MADE WITH  
THE AID OF MOTION PICTURES, SOUND RECORDERs, AND STOP  
WATCHES, PROVIDED MOST OF THE DATA NECESSARY FOR  
ACTIVITY ANALYSIS AND TASK ALLOTMENTS FOR PRESENT  
SUBMARINES. INTERVIEW AND QUESTIONNAIRE MATERIAL  
OBTAINED FROM EXPERIENCED PERSONNEL REVEALED  
SHORTCOMINGS OF PRESENT DESIGNS AND PROCEDURES AND  
PROVIDED INFORMATION CONCERNING MINE PLANTING  
ACTIVITIES. FINALLY, A HUMAN ENGINEERING ANALYSIS  
OF PRESENT TORPEDO ROOMS, COMBINED WITH A KNOWLEDGE  
OF THE PROJECTED DESIGN OF THE SS 563/564, PROVIDED  
A BASIS FOR RECOMMENDATIONS CONCERNING ARRANGEMENT  
AND DESIGN OF EQUIPMENT AND TASK ALLOTMENTS FOR  
FUTURE SUBMARINES. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-643 116 13/10  
DUNLAP AND ASSOCIATES INC STAMFORD CONN

HUMAN ENGINEERING STUDY OF THE AGSS569 CONTROL  
ROOM.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
MAR 54 68P TRABOLD, FREDERICK W. SKELLEY,  
CHARLES R. ELY, JEROME M. CHANNELL, RALPH C. I

CONTRACT: NBUNR-641(U2)  
PROJ: SPECDEVCE-2U-F-2, NR-784-002  
MONITUR: SPECDEVCE 641-2-15

UNCLASSIFIED REPORT

DESCRIPTIONS: (+SUBMARINES, DESIGN), (+HUMAN  
ENGINEERING, SUBMARINES), CONTROL SYSTEMS,  
SUBMARINE PERSONNEL, INSTRUMENT PANELS,  
ILLUMINATION, SEATS, OPERATORS(PERSONNEL),  
SUBMARINE PERISCOPE, DIVING

(U)

THE PURPOSE OF THIS REPORT IS TO PRESENT  
RECOMMENDATIONS DESIGNED TO IMPROVE THE PERFORMANCE  
OF OPERATIONS WITHIN THE CONTROL ROOM OF THE  
AGSS569 SUBMARINE. EMPHASIS IS PLACED ON THE  
LAYOUT OF STATIONS AND EQUIPMENT, THE DESIGN OF  
CONTROLS AND INSTRUMENTS, THE ILLUMINATION OF THE  
DISPLAYS, AND CORRECT SEATING FOR THE OPERATORS. (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CUNTPOL NO. /ZMK23

AU-643 117 13/10  
DUNLAP AND ASSOCIATES INC STAMFORD CONN

LAYOUT, COMMUNICATION AND SEATING IN THE AIR CONTROL CENTER OF THE MIGRAINE III TYPE SUBMARINE. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,

PER 52 47P BRIDGEWATER, JOHN B. SELY,  
JEROME M. CHANNELL, RALPH C.;  
CONTRACT: NBUNR-041 (U2)  
PROJ: SPECDEV/CEN-ZU-F-4 , NR-784-UU2  
MONITOR: SPECDEV/CEN 641-2-14

UNCLASSIFIED REPORT

DESCRIPTIONS: (SUBMARINES, AIR CONTROL CENTERS),  
(AIR CONTROL CENTERS, HUMAN ENGINEERING),  
COMMUNICATION SYSTEMS, SEATS,  
OPERATORS(PERSONNEL), RADAR EQUIPMENT, DISPLAY  
SYSTEMS, PICKET SHIPS, UNDERGATED VEHICLES  
IDENTIFIERS: MIGRAINE III SUBMARINE (U) (U)

THE PURPOSE OF THIS REPORT IS TO PRESENT THE FINDINGS OF A HUMAN ENGINEERING STUDY OF THE AIR CONTROL CENTER (ACC) OF THE MIGRAINE III TYPE SUBMARINE. THIS STUDY WAS ORIGINALLY DESIGNED TO DEVELOP A LAYOUT OF WORKPLACES AND MAJOR PIECES OF EQUIPMENT IN THE ACC. UPON COMPLETION OF THE RECOMMENDED LAYOUT, HOWEVER, THE STUDY WAS BROADENED TO INCLUDE AN EVALUATION OF COMMUNICATIONS PROCEDURES AND SEATING REQUIREMENTS WITHIN THE ACC. (U)

UNCLASSIFIED

UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-643 153 13/10  
DUNLAP AND ASSOCIATES INC STAMFORD CONN

ARRANGEMENT OF EQUIPMENT ON THE SSK CONVERSION. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
APR 50 18P TOLCOTT, MARTIN A. ;  
CONTRACT: NBUNR-641(U2)  
PROJ: NR-784-UU2 ,SPECDEVGEN-ZU-F-2  
MONITOR: SPELDEVGEN 641-2-5

UNCLASSIFIED REPORT

DESCRIPTORS: (\*ANTISUBMARINE WARFARE, SUBMARINES),  
(\*SUBMARINES, HUMAN ENGINEERING), ANTISUBMARINE  
FIRE CONTROL SYSTEMS, SONAR, SUBMARINE PERSONNEL,  
UNDERWATER COMMUNICATION SYSTEMS, RADAR,  
ANTISUBMARINE DEFENSE SYSTEMS, UNDERSEA WARFARE (U)

THE SSK CONVERSION IS A MODIFICATION OF THE SS  
214 RESULTING FROM EXTENSIVE INTERIOR AND EXTERIOR  
STRUCTURAL CHANGES AND THE ADDITION OF CERTAIN SONAR  
AND FIRE CONTROL EQUIPMENT. ITS PRIMARY MISSION  
WILL BE TO SERVE AS AN ANTI-SUBMARINE SUBMARINE, AND  
IT HAS BEEN EQUIPPED TO HOVER ON STATION FOR THE  
PURPOSE OF DETECTING AND ATTACKING ENEMY SUBMARINES.  
SINCE NEW PRINCIPLES OF OPERATION ARE INVOLVED, THE  
BUREAU OF SHIPS THROUGH SPECIAL DEVICES  
CENTER HAS REQUESTED THAT A HUMAN ENGINEERING STUDY  
BE MADE TO DETERMINE THE OPTIMAL ARRANGEMENT OF THE  
SYSTEM. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AU-643 154 13/10  
DUNLAP AND ASSOCIATES INC STAMFORD CONN

HUMAN FACTORS IN THE DESIGN OF SUBMARINE  
COMMUNICATION SYSTEMS. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
JUN SU 73P GIRDEN,E. ;  
CONTRACT: NBUNR-641(U2)  
PROJ: NR-784-002 ,SPECDEVCE-20-F-2  
MONITOR: SPECDEVCE 641-2-8

UNCLASSIFIED REPORT

DESCRIPTIONS: (UNDERWATER COMMUNICATION SYSTEMS,  
SUBMARINES), (SUBMARINES, DESIGN), HUMAN  
ENGINEERING, PUBLIC ADDRESS SYSTEMS, SUBMARINE  
PERSONNEL, SONAR, UNDERSEA WARFARE,  
MANEUVERABILITY, DATA TRANSMISSION SYSTEMS (U)

THE INCREASED SPEED AND MANEUVERABILITY OF MODERN  
SUBMARINES DEMAND EXTREMELY EFFICIENT COMMUNICATIONS.  
THE PRESENT REPORT IS CONCERNED WITH IMPROVING THE  
FLOW OF INFORMATION BETWEEN THE VARIOUS COMPARTMENTS  
ON FLEET AND GUPPY SUBMARINES. THE EMPHASIS IS  
UPON THE OPTIMUM DESIGN AND USE OF COMMUNICATION  
CIRCUITS. VALUABLE INFORMATION WAS OBTAINED FROM A  
COMMUNICATIONS QUESTIONNAIRE, RESPONDED TO BY ALL 44  
ACTIVE SUBMARINES IN THE ATLANTIC FLEET.  
ADDITIONAL EVIDENCE WAS COLLECTED THROUGH EXTENSIVE  
OBSERVATIONS, SOUND RECORDINGS, AND INTERVIEWS.  
THE DATA WERE ANALYZED TO DETERMINE (1) THE  
ESSENTIAL COMMUNICATIONS DURING VARIOUS PHASES OF  
OPERATION, (2) THE EXTENT TO WHICH CURRENT  
PROCEDURES SATISFY THESE REQUIREMENTS, AND (3)  
THE CHANGES AND IMPROVEMENTS WHICH ARE NEEDED. (U)

UNCLASSIFIED

UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-643 155 13/10  
DUNLAP AND ASSOCIATES INC STAMFORD CONN

HUMAN ENGINEERING APPRAISAL OF THE AIR CONTROL CENTER  
OF PICKET SUBMARINES. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
DEC 50 78P ELY, JEROME H.; JACOBS,  
HERBERT M.; HEIGANDT, JOSEPH H.; CHANNELL, RALPH  
C.

CONTRACT: NBUNR-641(02)  
PROJ: NR-784-0U2 ,SPECDEV/CEN-2U-F-2  
MONITOR: SPECDEV/CEN 641-2-1U

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SUBMARINES, AIR CONTROL CENTERS),  
(\*AIR CONTROL CENTERS, HUMAN ENGINEERING), PICKET  
SHIPS, SUBMARINE PERSONNEL, SEARCH RADAR,  
DETECTION, RADAR OPERATORS, INTERCEPTION,  
PLOTTING BOARDS (U)

THIS STUDY HAS BEEN DESIGNED TO EVALUATE THE AIR  
CONTROL CENTER (ACC) OF THE PICKET SUBMARINE  
FROM A HUMAN ENGINEERING VIEWPOINT AND TO MAKE  
RECOMMENDATIONS CONCERNING ITS OPERATING PROCEDURES  
AND ARRANGEMENT OF EQUIPMENT. (U)

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UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NU. /ZHK23

AD-643 655 :3/10  
DUNLAP AND ASSOCIATES INC STAMFORD CONN

SUBMARINE CONTROL BY A SINGLE OPERATOR.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
UCT 53 132P KELLEY, CHARLES R.; ELY,  
JEROME M.; CHANNELL, RALPH C.;  
CONTRACT: NONR-954(0U)  
PROJ: SPCLDEVCE-2U-F-2  
MONITOR: SPCLDEVCE 954-00-18

UNCLASSIFIED REPORT

DESCRIPTORS: (SUBMARINES, CONTROL PANELS),  
(CONTROL PANELS, OPERATORS(PERSONNEL)),  
SUBMARINE PERSONNEL, HUMAN ENGINEERING, CONTROL  
SYSTEMS, DESIGN, PERFORMANCE(ENGINEERING),  
INSTRUMENTATION, POSITIONING REACTIONS, CONTROL  
KNOBS

(U)

THIS REPORT IS AN ANALYSIS OF SOME OF THE PROBLEMS  
INVOLVED IN ONE-MAN SUBMARINE CONTROL. IT IS AN  
ATTEMPT TO STUDY SYSTEMATICALLY THE SUBMARINE CONTROL  
SYSTEM, ASSUMING THERE IS A SINGLE HUMAN LINK BETWEEN  
THE SENSING INSTRUMENTS MEASURING THE SUBMARINE'S  
PERFORMANCE AND THE CONTROL SURFACES USED TO MINIMIZE  
ERRORS IN THIS PERFORMANCE.

(U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-643 820 13/10 5/10  
DUNLAP AND ASSOCIATES INC STAMFORD CONN

ILLUMINATION IN THE ATTACK CENTER AND PERISCOPE AREA  
OF THE SS 563/564. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
AUG 44 47P ORLANSKY, JESSE J GIRDEN,  
EDWARD I CHAN, GRACE S. I CHANNELL, RALPH C. I  
CONTRACT: N8UNK-341(U2)  
PROJ: NR-784-002, SPECDEVVCEN-20-F-2  
MONITOR: SPECDEVVCEN 641-2-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPORT ON HUMAN ENGINEERING  
SYSTEM STUDIES.

DESCRIPTORS: (\*SUBMARINES, ILLUMINATION),  
(\*ILLUMINATION, SPECIFICATIONS), SUBMARINE  
PERISCOPES, LIGHTING EQUIPMENT, SUBMARINE PERSONNEL,  
ADAPTATION(PHYSIOLOGY), VISION, BRIGHTNESS,  
PERFORMANCE(HUMAN), HUMAN ENGINEERING (U)

THIS REPORT EVALUATES THE ROOM AND INSTRUMENT  
ILLUMINATION REQUIRED FOR EFFICIENT PERFORMANCE IN  
THE ATTACK CENTER AND PERISCOPE AREA OF THE  
CLASS 563/564 SUBMARINE. COGNIZANT NAVY  
PERSONNEL WERE INTERVIEWED TO DETERMINE PROBABLE  
OPERATIONAL PROCEDURES IN THE ATTACK CENTER AND  
PERISCOPE AREA. THE IMPLICATION OF THESE  
PROCEDURES FOR ILLUMINATION WAS CONSIDERED. THEN,  
PROVISIONAL LIGHTING SPECIFICATIONS WERE DEVELOPED  
FOR THESE AREAS. IN DOING SO, ATTENTION WAS PAID  
TO THE CURRENT NAVY SPECIFICATIONS AND TO THE  
RELEVANT LITERATURE. (U)

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/ZHK23

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UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AD-648 933 17/2 20/1 S/1U  
FLORIDA UNIV GAINESVILLE COMMUNICATION SCIENCES LAB

UNDERWATER SPEECH COMMUNICATION. (U)

DESCRIPTIVE NOTE: SEMIANNUAL PROGRESS REPT. NO. 4,  
FEB 67 OP HOLLIDEN, HARRY ; BRANDT, JOHN I  
THOMPSON, CARL ;  
CONTRACT: NONR-580(2U)

UNCLASSIFIED REPORT

DESCRIPTORS: (VOICE COMMUNICATION SYSTEMS,  
UNDERWATER), SOUND TRANSMISSION, UNDERWATER  
SOUND, SPEECH, INTELLIGIBILITY, HEARING,  
THRESHOLDS(PHYSIOLOGY), AUDITORY ACUITY,  
HYDROPHONES, UNDERWATER SOUND EQUIPMENT, SCUBA  
DIVERS, SPEECHrecognition (U)

A LIST IS GIVEN OF RESEARCH REPORTS, BOTH COMPLETED  
AND IN PROGRESS, IN THE FIELD OF UNDERWATER SPEECH  
COMMUNICATION. PLANNED RESEARCH PROJECTS INCLUDE  
HEARING STUDIES, SPEECH STUDIES, AND EVALUATION OF  
SOUND LOCALIZATION EQUIPMENT. (U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-646 Y34 17/2 20/1  
FLORIDA UNIV GAINESVILLE COMMUNICATION SCIENCES LAB

SPEECH INTELLIGIBILITY OF THE BENDIX WATERCOM  
SYSTEM

(U)

DESCRIPTIVE NOTE: PROGRESS REPT. NO. 1,  
UEC 66 7P HOLLIDAY, HARRY;  
CONTRACT: NONR-580(2U)

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPT. ON UNDERWATER SPEECH  
COMMUNICATION.

DESCRIPTORS: (VOICE COMMUNICATION SYSTEMS,  
UNDERWATER), (UNDERWATER SOUND EQUIPMENT,  
SPEECH TRANSMISSION), SPEECH, HYDROPHONES,  
STANDARDIZATION, EFFICIENCY, SCUBA DIVERS, SOUND  
TRANSMISSION, UNDERWATER SOUND, INTELLIGIBILITY,  
SPEECH RECOGNITION

(U)

THE PILOT STUDY WAS FOCUSED ON THE EVALUATION OF A  
COMMERCIAL DIVER COMMUNICATION SYSTEM AND ON THE  
DEVELOPMENT OF STANDARDIZED AND PRECISE METHODS FOR  
SUCH SYSTEM EVALUATION. SEVEN DIVERS, AT 30 FEET,  
READ PB WORD LISTS OVER THE BENDIX WATERCOM  
SYSTEM. SIXTY-ONE LISTENERS (12 DIVERS AND 49  
COLLEGE STUDENTS) WERE USED TO EVALUATE SYSTEM  
INTELLIGIBILITY. RESULTS ARE DISCUSSED; ALSO  
INCLUDED IS A DESCRIPTION OF INFORMATION WHICH WILL  
BE NEEDED BEFORE HIGHLY EFFICIENT UNDERWATER  
COMMUNICATORS CAN BE DEVELOPED. (AUTHOR)

(U)

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UNCLASSIFIED

/ZHK23

UNCLASSIFIED

UDC REFUND BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-648 935 17/2 20/1 5/1U  
FLORIDA UNIV GAINESVILLE COMMUNICATION SCIENCES LAB

A DIVER COMMUNICATION RESEARCH SYSTEM (DICORS). (U)

DESCRIPTIVE NOTE: PROGRESS REPT. NO. 2,  
JAN 67 IIP MOLLIEN,HARRY ;THOMPSON,CARL  
CONTRACT: NOHR-5001201

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: KEPT. ON UNDERWATER SPEECH  
COMMUNICATION.

DESCRIPTIONS: (1)VOICE COMMUNICATION SYSTEMS,  
UNDERWATER), (2)UNDERWATER SOUND EQUIPMENT,  
SPEECH TRANSMISSION), SPEECH, INTELLIGIBILITY,  
SCUBA DIVERS, HEARING, AUDITORY SIGNALS, VISUAL  
SIGNALS, CONTROL SYSTEMS,  
THRESHOLUS(PHYSIOLOGY), SPEECHrecognition (U)

A SYSTEM IS DESCRIBED WHICH PROVIDES A RIGOROUSLY  
CONTROLLED MILIEU WITHIN WHICH THE TESTING OF HEARING  
AND SPEAKING FUNCTIONS UNDERWATER CAN BE  
ACCOMPLISHED. PROVISIONS ARE MADE FOR (1) THE  
PRESENTATION AND RECEPTION OF ACOUSTIC STIMULI,  
(2) THE TRANSMISSION OF VISUAL MATERIAL FOR USE  
EITHER AS MULTIPLE CHOICE HEARING TEST RESPONSE ITEMS  
OR AS TEST MATERIAL FOR STUDIES OF SPEECH PRODUCTION  
AND (3) THE TRANSMISSION OF MULTIPLE CHOICE  
RESPONSES BY THE SUBJECT TO A DIGITAL (IBM) SURFACE  
CONTROL UNIT. RESEARCH IS CURRENTLY IN PROGRESS  
UTILIZING THIS UNIT (DICORS) IN (1) THE  
EVALUATION OF NORMAL HEARING THRESHOLUS FOR PURE  
TONES AND SPEECH, (2) THE EVALUATION OF SPEECH  
DISCRIMINATION, (3) EVALUATING DIVER'S  
CAPABILITIES TO SPEAK UNDERWATER, AND (4)  
EVALUATING COMMERCIAL UNDERWATER SPEECH  
COMMUNICATIONS SYSTEMS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-650 933 5/9 14/1  
NAVAL PERSONNEL RESEARCH ACTIVITY SAN DIEGO CALIF

QUANTIFICATION OF PERSONNEL PERFORMANCE FOR COST  
EFFECTIVENESS DECISIONS: I. AN ANNOTATED  
BIBLIOGRAPHY.

(U)

DESCRIPTIVE NOTE: RESEARCH MEMO.,  
APR 67 68P WILLIS, JOE E. IDOW, ANDREW  
No. ;  
REPT. NO. SRM-67-15  
PROJ: PF-U16U208U1

UNCLASSIFIED REPORT

DESCRIPTORS: (\*NAVAL PERSONNEL,  
PERFORMANCE (HUMAN)), (\*COST EFFECTIVENESS,  
SYSTEMS ENGINEERING), BIBLIOGRAPHIES,  
PREDICTIONS, EFFECTIVENESS, RELIABILITY,  
MANPOWER

(U)

AS THE FIRST PHASE OF A PROJECT TO DEVELOP A METHOD  
OF PREDICTING PERSONNEL PERFORMANCE EFFECTIVENESS, A  
SEARCH OF THE LITERATURE WAS MADE. QUOTES, NOTES,  
AND COMMENTS FOR THE USE OF THE RESEARCH TEAM WERE  
MADE FOR EACH ARTICLE. FROM THE MATERIALS  
ASSEMBLED, 115 ITEMS WERE SELECTED FOR AN ANNOTATED  
BIBLIOGRAPHY COVERING FIVE AREAS: (1)  
PERSONNEL PERFORMANCE EFFECTIVENESS MEASUREMENT,  
(2) PERSONNEL PERFORMANCE EFFECTIVENESS  
PREDICTION, (3) HUMAN RELIABILITY IN SYSTEMS,  
(4) PERSONNEL PERFORMANCE DATA UTILIZATION  
PROBLEMS, AND (5) FUNCTION ALLOCATION.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-651 474 5/10  
YALE UNIV NEW HAVEN CUNN

PROLONGED STRESS IN SEALAB II: A FIELD STUDY OF INDIVIDUAL AND GROUP REACTIONS. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
67 96P HELMREICH,ROBERT L.;  
REPT. NO. TR-1  
CONTRACT: NUNR(G)-00012-66, NUNR(G)-00030-66

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: DOCTORAL THESIS.

DESCRIPTIONS: (\*STRESS(PSYCHOLOGY), UNDERWATER), REACTION(PSYCHOLOGY), GROUP DYNAMICS, PERFORMANCE(HUMAN), LEADERSHIP, SOCIOCHEMICS, PSYCHOMETRICS, FEAR, SOCIAL PSYCHOLOGY, PERSONALITY TESTS, EMOTIONS, THESES  
IDENTIFIERS: SEALAB (U) (U)

AN INVESTIGATION WAS MADE OF INDIVIDUAL AND GROUP REACTIONS TO EXTREME, PROLONGED STRESS IN A FIELD SITUATION CONDUCTED AS PART OF PROJECT SEALAB II. THE 26 DIVERS COMPLETED PERSONALITY AND DEMOGRAPHIC QUESTIONNAIRES PRIOR TO SUBMERSION. WHILE UNDERWATER, THEY FILLED OUT CHECKLISTS AND WERE CONTINUOUSLY MONITORED BY CLOSED-CIRCUIT AUDIO AND TELEVISION. DIVERS UNDERWATER WERE SIGNIFICANTLY MORE FEARFUL AND AROUSED THAN ON THE SURFACE PRIOR TO SUBMERSION. THE THREE 10 MEN TEAMS WHICH LIVED TOGETHER UNDERWATER BECAME SIGNIFICANTLY MORE COHESIVE AFTER SUBMERSION. EVALUATION OF SOCIOCHEMATIC CHOICES OF LEADERS INDICATED THAT AGE AND Maturity WERE THE ONLY CHARACTERISTICS ASSOCIATED WITH BEING CHOSEN AS A LEADER. PERFORMANCE, FEAR, AROUSAL, GREGARIOUSNESS AND CHOICE AS A PEER WERE NOT RELATED TO LEADER CHOICE. SELF-REPORTED FEAR AND AROUSAL WERE SIGNIFICANTLY CORRELATED WITH PERFORMANCE CRITERIA. THE MORE FRIGHTENED AND AROUSED DIVERS DEMONSTRATED INFERIOR PERFORMANCE. FIRST-BORN AND ONLY CHILDREN WERE SIGNIFICANTLY MORE FRIGHTENED AND SHOWED SIGNIFICANTLY POORER PERFORMANCE THAN LATER-BORNS. FAILURE OF AN INDIVIDUAL TO SHARE IN GROUP ACTIVITIES AND SOCIAL BEHAVIOR WAS ASSOCIATED WITH HIGHER LEVELS OF REPORTED STRESS AND INFERIOR PERFORMANCE. USING SIX PREDICTORS IN A MULTIPLE REGRESSION, IT WAS POSSIBLE TO ACCOUNT FOR 50% OF THE VARIANCE OF EACH OF THREE OBJECTIVE PERFORMANCE CRITERIA. (AUTHUR) (U)

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/ZHK23

UNCLASSIFIED

UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-651 994 6/19 5/9  
OFFICE OF NAVAL RESEARCH WASHINGTON D C

AN EXPERIMENTAL 45-DAY UNDERSEA SATURATION DIVE AT  
205 FEET, SEALAB II PROJECT GROUP. (U)

DESCRIPTIVE NOTE: SUMMARY REPT.,  
MAR 67 44P PAULI,D. C. SCLAPPER,G.  
P. I  
REPT. NU. UNR-ACH-1245

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPT. ON PROJECT SEALAB.

DESCRIPTORS: (BREATHING APPARATUS, UNDERWATER EQUIPMENT), (OCEAN BOTTOM, DIVING), NAVAL RESEARCH, PHYSIOLOGY, PERFORMANCE(HUMAN), SALVAGE, MARINE BIOLOGY, OCEANOLOGY, VISIBILITY, DECOMPRESSION, RECOVERY, NAVAL PERSONNEL (U)

SEALAB II DEMONSTRATED THAT: THE CONCEPT OF OCEAN-FLOOR HABITATION TO ACCOMPLISH A WIDE RANGE OF SALVAGE AND SCIENTIFIC TASKS IS COMPATIBLE WITH MAN'S ABILITY TO PERFORM USEFUL WORK AT THESE DEPTHS; NO SIGNIFICANT SHORT-TIME PHYSIOLOGICAL CHANGES OCCUR WHICH RESULTED IN DETERIORATION OF THE AQUANAUTS PHYSICAL CONDITION; THERE IS A DEGRADATION OF HUMAN PERFORMANCE WHICH INCREASES WITH THE COMPLEXITY OF THE TASK BEING ACCOMPLISHED. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-652 315 6/10 6/19  
NATIONAL ACADEMY OF SCIENCES-NATIONAL RESEARCH COUNCIL  
WASHINGTON & C COMMITTEE ON UNDERSEA WARFARE

PROCEEDINGS OF THE SYMPOSIUM ON UNDERWATER PHYSIOLOGY  
(3RD), 23, 24, AND MARCH 1966, WASHINGTON, D. C.,  
(U)

67 518P LAMBERTSEN, C. J. ;  
CONTRACT: N0NR-2303(U8)

UNCLASSIFIED REPORT

AVAILABILITY: AVAILABLE FROM THE WILLIAMS AND  
WILKINS CO., 428 E. PRESTON ST., BALTIMORE,  
MD. 21202 \$17.00.

SUPPLEMENTARY NOTE: PUBLISHED BY THE WILLIAMS AND WILKINS  
CO., BALTIMORE, MD., 1967.

DESCRIPTIONS: (PHYSIOLOGY, UNDERWATER),  
SYMPOSIA, DIVING, NAVAL RESEARCH, FIRES, HUMAN  
ENGINEERING, DECOMPRESSION SICKNESS,  
PSYCHOPHYSIOLOGY, SPEECH, HIGH-PRESSURE RESEARCH,  
OXYGEN, ETIOLOGY, THERAPY, BRAIN, GAS  
EMBOLISM, PERFORMANCE(HUMAN), RESPIRATION,  
HYDROSTATIC PRESSURE, TOXICITY,  
TOLERANCES(PHYSIOLOGY) (U)

CONTENTS: RECENT NAVAL EXPERIENCES IN  
EXTENDING USEFUL DIVING DEPTHS; THE  
PROBLEM OF FIRE; SATURATION DIVING;  
SPECIAL PROBLEMS IN THE ETIOLOGY AND  
TREATMENT OF DECOMPRESSION SICKNESS;  
POTENTIAL ADVANCES IN DEEP DIVING;  
LIMITATIONS OF PHYSIOLOGICAL PERFORMANCE AT  
EXTREME AMBIENT PRESSURES; PHYSICAL AND  
CELLULAR MECHANISMS. (U)

UNCLASSIFIED

UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-652 374 13/10 0/16 14/2  
OFFICE OF NAVAL RESEARCH WASHINGTON D C

AN EXPERIMENTAL 45-DAY UNDERSEA SATURATION DIVE AT  
205 FLEET SEALAB II PROJECT GROUP. (U)

MARK 67 43UP PAULI, U. C. ICLAPPEH, G.  
P. ;  
REPT. NU. UNR-ACK-124

UNCLASSIFIED REPORT  
AVAILABILITY: HARO COPY AVAILABLE FROM  
SUPERINTENDENT OF DOCUMENTS, GPO, WASHINGTON, D.  
C. 20402 52-25.

SUPPLEMENTARY NOTE: REPT. ON PROJ. SEALAB. SEE ALSO  
SUMMARY, AD-651 999.

DESCRIPTORS: (\*OCEAN BOTTOM, \*DIVING),  
(\*LABORATORIES, UNDERWATER),  
(\*ADAPTATION(PHYSIOLOGY), OCEAN BOTTOM),  
(\*UNDERWATER EQUIPMENT, NAVAL RESEARCH), HUMAN  
ENGINEERING, OCEANOGRAPHIC EQUIPMENT, UNDERWATER  
EQUIPMENT, LIFE SUPPORT, STRESS(PHYSIOLOGY),  
DECOMPRESSION, PSYCHOLOGY,  
TOLERANCES(PHYSIOLOGY), SALVAGE, CONTINENTAL  
SHELVES, OCEANOLOGY, NAVAL PERSONNEL  
IDENTIFIERS: SEALAB PROJECT (U)

THE SEALAB II OPERATION WAS CONDUCTED BETWEEN  
AUG. 26 TO OCT. 14, 1965, 300 FT OFF SCRIPPS  
PIER AT LA JOLLA, CALIFORNIA, IN A DEPTH OF  
WATER OF 205 FT. USING A SYNTHETIC BREATHING GAS  
OF HELIUM, OXYGEN, AND NITROGEN, EACH OF THE THREE  
AQUANAUT TEAM LIVED UNDER PRESSURE APPROXIMATELY 15  
DAYS IN AN OCEAN-FLUOR HABITAT, MAKING FORAYS INTO  
THE 40F. S TO 30 FT VISIBILITY BOTTOM WATERS FOR  
PERIODS RANGING FROM A FEW MINUTES TO AN EXTENDED  
DIVE OF 3 HOURS. EXCURSION NO-DECOMPRESSION DIVES  
TO 200 FT AND 300 FT WERE ACCOMPLISHED. DIVING  
FROM THE HABITAT WAS ACCOMPLISHED USING BOTH  
SEMICLOSED-CIRCUIT BREATHING APPARATUS AND HOOKAH  
(HABITAT-CONNECTED-HOSE) BREATHING APPARATUS.  
A DECOMPRESSION COMPLEX NEW TO THE NAVY  
CONSISTING OF A PERSONNEL TRANSFER CAPSULE MATING  
WITH A DECK DECOMPRESSION CHAMBER WAS USED FOR  
ACCUMPLISHING RECOVERY AND DECOMPRESSION OF  
AQUANAUTS. SEALAB II DEMONSTRATED THAT:  
(1) THE CONCEPT OF OCEAN-FLUOR HABITATION TO  
ACCUMPLISH A WIDE RANGE OF SALVAGE AND SCIENTIFIC  
TASKS IS COMPATIBLE WITH MAN'S ABILITY TO PERFORM  
USEFUL WORK AT THESE DEPTHS. (2) NO  
SIGNIFICANT SHORT-TIME PHYSIOLOGICAL CHANGES OCCUR. (U)

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/ZHK23

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-652 405 6/17 11/10  
NAVY ELECTRONICS LAB SAN DIEGO CALIF

DIVERS' BODY HEAT LOSS: DESCRIBES A STUDY OF THE  
ENDURANCE OF UNDERWATER SWIMMERS WEARING A VARIETY OF  
FOAM NEOPRENE WET SUITS AND IMMERSED AT 30-32F IN THE  
NEL ARCTIC POOL. (U)

DESCRIPTIVE NOTE: RESEARCH RLPT.,  
OCT 66 39P BEAGLES, J. A. (COIL, E.  
F. I  
REPT. NU. NEL-1408  
PROJ: SR-011-01-U1  
TASK: U4U1

UNCLASSIFIED REPORT

DESCRIPTORS: (UNDERWATER CLOTHING, ARCTIC  
REGIONS), (SYNTHETIC RUBBER, UNDERWATER  
CLOTHING), DESIGN, SUCKS, GLOVES, BODY  
TEMPERATURE, EXPOSURE, EFFECTIVENESS, SCUBA DIVERS (U)

A STUDY WAS MADE PRIMARILY TO OBTAIN DATA  
APPLICABLE TO THE DESIGN OF AN OPTIMUM PROTECTIVE  
SUIT FOR DIVERS IN ARCTIC ENVIRONMENTS. THE  
EXPERIMENTAL METHOD EMPLOYED SWIMMERS WHO PERFORMED  
SHALLOW DIVES IN THE NEL ARCTIC POOL AT 30-32F.  
SKIN TEMPERATURE WAS RECORDED BY THE USE OF  
SUITABLY LOCATED THERMISTORS, AND OTHER DATA WERE  
OBTAINED FROM BLOOD SAMPLES DRAWN IMMEDIATELY BEFORE  
AND AFTER EACH DIVE. RESULTS SUGGEST THAT A FOUR-  
PIECE FOAM NEOPRENE WET SUIT CONSISTING OF A 1/8-INCH  
TIGHT-FITTING INNER SUIT AND A 1/4-INCH SNUG-FITTING  
OUTER SUIT ALONG WITH TWO PAIRS OF NEOPRENE SOCKS AND  
MITTENS WOULD PROVIDE THE OPTIMUM COMBINATION OF  
PROTECTION AND MOBILITY FOR DIVERS IN ARCTIC WATERS.  
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-653 755 6/19  
DUNLAP AND ASSOCIATES INC DARIEN CONN

STUDIES OF THE PERFORMANCE CAPABILITIES OF DIVERS:  
THE EFFECTS OF COLD. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
MAR 67 59P BOWEN, HUGH M.; PEPLER,  
RICHARD D.;  
REPT. NU. SSU67-399  
CONTRACT: N00014-67-C-0263, NONR-4986(UO)  
PROJ: NR-196-065

UNCLASSIFIED REPORT

DESCRIPTORS: (DIVING, STRESS(PHYSIOLOGY)),  
PERFORMANCE(HUMAN), TOUCH, SENSITIVITY,  
MOTION, REASONING, PROBLEM SOLVING, MEMORY,

ATTENTION, MOTOR REACTIONS, UNDERWATER (U)

IDENTIFIERS: COLD TOLERANCE (U)

THE STUDY EXAMINES THE PERFORMANCE CAPABILITIES OF DIVERS. TRIALS WERE CONDUCTED AT VARIOUS WATER TEMPERATURES TO ASSESS THE EFFECTS OF COLD. DRY LAND TRIALS PROVIDED CONTROL PERFORMANCE SCORES. THE CAPABILITIES TESTED WERE: TACTILE SENSITIVITY, MANUAL DEXTERITY, MANUAL MOVEMENT, REASONING(ARITHMETIC), PROBLEM SOLVING, MEMORY, AND A MULTI-TASK CAPABILITY REQUIRING SIMULTANEOUS MANUAL TRACKING AND ATTENTION TO AN AUDIO CHANNEL. THE DATA INDICATES THAT DIVING IN WARM WATER CAUSES LOSS IN MOTOR FUNCTIONS DUE, IT IS THOUGHT, TO THE CHANGES AND HINDRANCES EXPERIENCED IN THE DIVING CONDITION. DIVING IN COLD WATER INCREASES THE MOTOR LOSS AND CAUSES DISTRACTION AND DISRUPTION IN MENTAL TASKS; 'BLOCKING' IN ATTENTION AND LOWERED MEMORY CAPABILITY WERE FOUND. IMPAIRMENT OF PERFORMANCE ON THE MULTI-TASK WAS CONSIDERABLE. IT IS HYPOTHEZIZED THAT COLD WATER STRESS, IN ADDITION TO CAUSING SPECIFIC SENSORY AND MOTOR LOSSES, CAUSES INCREASING LOSSES OF CAPABILITY AS THE TASK BECOMES MORE COMPLEX AND IS MORE DEPENDENT ON SUSTAINED ATTENTION AND MEMORY FUNCTIONS. (AUTHOR) (U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-650 034 5/9  
DUNLAP AND ASSOCIATES INC STAMFORD CONN

TRAINING AND SUPERVISION OF CONTROLLERMEN.

(U)

DESCRIPTIVE NOTE: TECHNICAL DEPT.,  
APR 54 19P CHANNEL, RALPH C.;  
CONTRACT: NBUNH-641(U2);  
PROJ: NR-784-002, SPECDEVCE-20-F-2  
MONITOR: SPECDEVCE 641-2-7

UNCLASSIFIED REPORT

DESCRIPTORS: (SUBMARINE PERSONNEL, NAVAL TRAINING), (SUPERVISION, SUBMARINE PERSONNEL), CONTROL, HUMAN ENGINEERING, SUBMARINES, MARINE PROPULSION, PERFORMANCE(HUMAN), INSTRUCTION MANUALS

(U)

THE REPORT IS CONCERNED WITH THE PROBLEM OF IMPROVING CONTROLLERMAN PERFORMANCE. THE RECOMMENDATIONS ARE DIVIDED INTO TWO SECTIONS: INITIAL INDUCTRIATION OF THE CONTROLLERMAN, LARGEAT AT THE SUBMARINE SCHOOL, AND THE SUBSEQUENT SUPERVISION DURING SERVICE AT SEA. IT IS RECOMMENDED THAT THE NEWLY TRAINED CONTROLLERMAN BE CAREFULLY GUIDED AND SUPERVISED DURING HIS INITIAL TOUR OF SEA DUTY WITH AN EMPHASIS UPON CORRECT HAND ALLOCATION, PROPER SEQUENCE OF CONTROLLER MANIPULATION, AND PROMPT, POSITIVE ACTION. IT IS ALSO RECOMMENDED THAT THE DIALS OF RELATED INSTRUMENTS AND CONTROLLERS ABOARD ALL SUBMARINES BE IDENTIFIED WITH COLORED BORDERS SIMILAR TO THOSE RECOMMENDED FOR THE PROPULSION CUBICLE AT THE SUBMARINE SCHOOL. IN ORDER TO PROVIDE ADDED INCENTIVE FOR CONTINUED PRACTICE AND IMPROVEMENT, IT IS RECOMMENDED THAT EXPERT CONTROLLERMEN BE GIVEN A SPECIAL 'CONTROLLER QUALIFICATION' ENTRY IN THEIR SERVICE RECORD UPON PASSING A PRACTICAL EXAMINATION. THE ESSENTIAL NATURE OF THIS EXAMINATION SHOULD CONFORM TO THE TESTS USED AT THE SUBMARINE SCHOOL, AND SHOULD INCLUDE THE FOLLOWING CRITERIA: ACCURACY OF PERFORMANCE, PROPER HAND ALLOCATION TO LEVERS, CORRECT SEQUENCE OF MOVEMENTS, AND STANDARD TIMES FOR VARIOUS PROBLEMS.

(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-656 674 6/19 6/5  
MEDICAL CULL OF VIRGINIA RICHMOND DEPT OF PSYCHIATRY

A BIBLIOGRAPHICAL SOURCEBOOK OF COMPRESSED AIR,  
DIVING AND SUBMARINE MEDICINE, VOLUME III, (U)

DEC 66 J15P HOFF, EBBE CURTIS I GREENBAUM,  
LEON JACK, JR  
CONTRACT: N0NR-1134(04)  
PROJ: NR-102-527

UNCLASSIFIED REPORT

AVAILABILITY: HARD COPY AVAILABLE FROM  
SUPERINTENDENT OF DOCUMENTS, GPO, WASHINGTON, D.  
C., 20402 \$3.25.

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH NAVAL  
MEDICAL RESEARCH INST., BETHESDA, MD.

DESCRIPTORS: (STRESS(PHYSIOLOGY),  
UNDERWATER), MILITARY MEDICINE, COMPRESSED AIR,  
DIVING, SUBMARINE PERSONNEL, DECOMPRESSION  
SICKNESS, OXYGEN, CARBON DIOXIDE, HELIUM GROUP  
GASES, ACCLIMATIZATION, VISION, HEARING,  
HYDROSTATIC PRESSURE, TOXICITY, PATHOLOGY,  
CARBON MONOXIDE, POISONING, MOTION SICKNESS,  
SUBMARINE ESCAPE, VENTILATION, AIR POLLUTION,  
SELECTION, HUMAN ENGINEERING, SLEEP,  
PERFORMANCE(HUMAN), SCUBA DIVERS, HAZARDS,  
DISEASES, ACCIDENTS, TRAINING, PSYCHIATRY (U)

CONTENTS: TECHNICAL PROCEDURES AND RESEARCH  
APPARATUS IN COMPRESSED AIR, DIVING AND SUBMARINE  
MEDICINE; SPECIAL ANATOMY, PHYSIOLOGY AND  
BIOCHEMISTRY OF COMPRESSED AIR, DIVING AND SUBMARINE  
MEDICINE; BIOLOGY OF VERY HIGH HYDROSTATIC  
PRESSURES; DISEASES AND ACCIDENTS IN SUBMARINE  
PERSONNEL, DIVERS, AND COMPRESSED AIR WORKERS;  
PROTECTION AND PRESERVATION OF PERSONNEL;  
SELECTION AND TRAINING OF SUBMARINE PERSONNEL,  
DIVERS AND COMPRESSED AIR WORKERS; SPECIAL  
PSYCHOLOGICAL AND PSYCHIATRIC PROBLEMS; SPECIAL  
PROBLEMS OF SCUBA DIVING. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-658 691 17/3 5/10 5/8  
JOHNS HOPKINS UNIV BALTIMORE MD

SPECIAL PROBLEMS IN THE ESTIMATION OF BEARING. (U)

DESCRIPTIVE NOTE: MEMORANDUM REPT.,  
JAN 48 44P REESE, T. W.; VOLKMANN, J. S.  
ROGERS, S. J.; KAUFMAN, L. L.;  
CONTRACT: NS0RI-166(U)1  
MONITOR: SPECDEVLEN MH-166-1-MHC-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH MT.  
HOLYOKE COLL., SOUTH HADLEY, MASS., DEPT. OF  
PSYCHOLOGY AND EDUCATION.

DESCRIPTIONS: (DIRECTION FINDING,  
PERFORMANCE(HUMAN)), ACCURACY, DECISION  
MAKING, DISPLAY SYSTEMS, TARGETS, NAVAL  
PERSONNEL (U)

THE SUBJECTS WERE ASKED THE FOLLOWING SPECIAL  
QUESTIONS: (1) WHAT EFFECT HAS THE LENGTH OF  
THE LINE OF LIGHT WHOSE BEARING IS TO BE JUDGED ON  
THE ACCURACY AND VARIABILITY OF THE SUBJECT'S  
JUDGMENTS. (THE LINE WHOSE BEARING IS TO BE JUDGED  
IS REFERRED TO AS THE BEARING INDICATOR). (2)  
WHAT HAPPENS TO ACCURACY AND VARIABILITY WHEN ONLY  
THE OUTER TIP OF THE BEARING INDICATOR IS SHOWN.  
(3) WHAT IS THE SIZE OF THE INDIVIDUAL  
DIFFERENCES IN BOTH ACCURACY AND VARIABILITY, AND IS  
THERE ANY RELATION BETWEEN ACCURACY AND VARIABILITY?  
THAT IS, DO THE MOST ACCURATE SUBJECTS TEND TO BE THE  
LEAST VARIABLE. THE ANSWERS TO THESE QUESTIONS  
ARE: FIRST, CHANGING THE LENGTH OF THE BEARING  
INDICATOR OVER A WIDE RANGE (FROM 93% OF THE  
RADIUS OF THE DISPLAY SCREEN TO ONLY 6.6% OF THE  
RADIUS) HAD LITTLE EFFECT ON EITHER THE ACCURACY OR  
THE VARIABILITY OF THE SUBJECTS' ESTIMATES.  
SECONDLY, THE OUTER TIP SEEMS TO BE THE MOST  
EFFECTIVE PORTION OF THE BEARING MARKER IN MAKING  
ACCURATE JUDGMENTS OF BEARING. IN FACT, UNDER THE  
CONDITIONS OF THIS EXPERIMENT, ACCURACY IS INCREASED  
AND VARIABILITY REDUCED WHEN ONLY THIS PORTION OF THE  
MARKER IS SHOWN. THIRLTY, THE MOST ACCURATE  
SUBJECT WAS ABOUT THREE TIMES MORE ACCURATE THAN THE  
LEAST ACCURATE SUBJECT. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-660 003 5/9 5/8  
NAVAL PERSONNEL RESEARCH ACTIVITY SAN DIEGO CALIF

FEASIBILITY OF THE DEVELOPMENT AND UTILIZATION OF  
PERSONNEL PERFORMANCE EFFECTIVENESS MEASURES FOR MAN/  
MACHINE FUNCTION ALLOCATION DECISIONS. (U)

DESCRIPTIVE NOTE: RESEARCH MEMO.,  
UCT 67 27P WILLIS, JUE E. I  
REPT. NU. NPRA-SRM-68-7  
TASK: PF-U16U201H04

UNCLASSIFIED REPORT

DESCRIPTORS: (\*MAN-MACHINE SYSTEMS,  
PERFORMANCE(HUMAN)), PERSONNEL MANAGEMENT,  
DECISION MAKING, EFFECTIVENESS, SYSTEMS  
ENGINEERING, NAVAL PERSONNEL (U)

THE REPORT SUMMARIZES RESEARCH UNDERTAKEN TO  
EXAMINE THE FEASIBILITY OF DEVELOPING A METHODOLOGY  
FOR PROVIDING QUANTITATIVE INDICES OF PERSONNEL  
PERFORMANCE EFFECTIVENESS (PPE), FOR USE IN  
MAN/MACHINE FUNCTION ALLOCATION DECISIONS. SUCH  
PPE INDICES WOULD ALSO PROVIDE A PERSONNEL INPUT TO  
THE GENERAL SYSTEMS EFFECTIVENESS MODEL. AFTER  
REVIEWING SOME OF THE MOST SIGNIFICANT WORK WHICH HAS  
BEEN DONE BY OTHERS IN THE PPE AREA, THE GENERAL  
APPROACH TO BE TAKEN IN DEVELOPING A NAVY PPE  
SYSTEM IS DESCRIBED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AD-66U 271

0/16

NAVAL SUBMARINE MEDICAL CENTER GROTON CONN SUBMARINE  
MEDICAL RESEARCH LAB

VISION UNDERWATER.

(U)

DEC 65 IOP KENT, PAUL H. S.  
REPT. NO. SMNL-498  
MONITOR: NAVMED MFD11.99.9002-4

UNCLASSIFIED REPORT

AVAILABILITY: PUBLISHED IN AMERICAN JOURNAL OF  
OPTOMETRY AND ARCHIVES OF AMERICAN ACADEMY OF  
OPTOMETRY V43 NY 553-65 SEP 1966.

SUPPLEMENTARY NOTE: PRESENTED AT THE ANNUAL MEETING OF  
THE AMERICAN ACADEMY OF OPTOMETRY, CHICAGO, ILL.,  
13 DEC 65.

DESCRIPTORS: (VISION, UNDERWATER),  
ADAPTATION(PHYSIOLOGY), SCUBA DIVERS,  
VISIBILITY, TARGET DISCRIMINATION, FLUORESCENCE,  
VISUAL ACUITY, SPACE PERCEPTION, PAINTS

(U)

VISUAL RESOLUTION OF LANDOLT RING TARGETS IN  
CLEAR WATER AT SHORT RANGE WAS FOUND TO BE BETTER  
THAN IN AIR AT THE SAME PHYSICAL DISTANCE, WHEN  
TARGET LUMINANCES WERE EQUATED FOR THE TWO  
CONDITIONS, BUT FELL BELOW PREDICTIONS BASED UPON THE  
MAGNIFICATION OF UNDERWATER TARGETS. THIS IS  
AScribed TO A GREATER LENS FOGGING PROBLEM UNDERWATER  
AND THE LACK OF SUFFICIENTLY SMALL TARGETS FOR SOME  
OBSERVERS. BOTH SIZE AND DISTANCE WERE  
OVERESTIMATED UNDERWATER, EXCEPT FOR SHORT RANGES.  
FLUORESCENT PAINTS WERE FOUND TO BE MORE VISIBLE  
UNDERWATER THAN NON-FLUORESCENT TYPES.

(AUTHOR)

(U)

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/ZMK23

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-662 221 13/10 13/9 13/8  
NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF

UNDERWATER TOOLS, EQUIPMENT, AND WORK TECHNIQUES: A SURVEY. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
NOV 67 SSP TEAGUE, DUNALD S., JR.  
MALLANGER, LAWRENCE W.;  
REPT. NU. NCEL-TR-548  
PROJ: Z-FU15-01-99-001

UNCLASSIFIED REPORT

DESCRIPTORS: (•SMALL TOOLS, UNDERWATER EQUIPMENT),  
STATE-OF-THE-ART REVIEWS, UNDERWATER CLOTHING,  
PNEUMATIC DEVICES, HYDRAULIC SYSTEMS, CUTTING  
TOOLS, DRILLING, JOINING, UNDERWATER COMMUNICATION  
SYSTEMS, UNDERWATER PHOTOGRAPHY, HOISTS, EXPLOSIVE  
ACTUATORS (U)

THE REPORT REVIEWS PUBLISHED AND UNPUBLISHED  
INFORMATION ON UNDERWATER EQUIPMENT (TOOLS,  
COMMUNICATIONS SYSTEMS, PHOTOGRAPHIC PARAPHERNALIA,  
AND DIVING GEAR) AND WORKING TECHNIQUES THAT CAN BE  
USED BY ONE OR TWO DIVERS AT NORMAL DIVING DEPTHS.  
UNDERWATER WORK TECHNIQUES (SUCH AS HAMMERING,  
SAWING, AND DRILLING) AND THE METHODS AND TOOLS  
USED TO PERFORM THEM ARE DISCUSSED. SPECIFIC  
IMPROVEMENTS NEEDED IN EQUIPMENT AND TECHNIQUES ARE  
LISTED. (AUTHOR) (U)

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UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-663 540 6/14  
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN

REPORT ON THE STANDARDIZATION OF NIGHT LOOKOUT  
STAGES. (U)

DESCRIPTIVE NOTE: REPT. NO. 1 ON PROJECT.  
MAY 45 YP VERPLANCK, R. S. I  
REPT. NO. NMRL-61  
PROJ: NAVMED-X-350

UNCLASSIFIED REPORT

DESCRIPTIONS: (NIGHT VISION, PERFORMANCE TESTS),  
STANDARDIZATION, NAVAL PERSONNEL,

PERFORMANCE(HUMAN), TEST EQUIPMENT (U)

IDENTIFIERS: LOOKOUTS(PERSONNEL) (U)

THE MEDICAL RESEARCH DEPARTMENT, U.S.  
SUBMARINE BASE, RECEIVED REPORTS OF THE RESULTS  
OF NIGHT LOOKOUT TRAINING FROM 40 ACTIVITIES  
THROUGHOUT THE NAVY. THESE REPORTS INCLUDED DATA  
ON MORE THAN 500,000 MEN TRAINED FOLLOWING A STANDARD  
PROCEDURE. EACH REPORT WAS ANALYZED WITH RESPECT  
TO THE PERCENTAGE OF MEN SIGHTING THE TARGET AT EACH  
BRIGHTNESS LEVEL AND AT THE CORRESPONDING VOLTMETER  
SETTING, AND MEDIAN VALUES FOR ALL REPORTING  
ACTIVITIES WERE DERIVED. WITH THESE DATA USED AS A  
BASIS, EACH ACTIVITY WAS ADVISED AS TO THE PROPER  
VOLTMETER SETTINGS TO EMPLOY, SO THAT THE TRAINING AT  
THE GREAT MAJORITY OF REPORTING ACTIVITIES HAS BEEN  
RENDERED RELATIVELY UNIFORM. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-663 614 5/5 13/10.1  
NAVAL SUBMARINE BASE NEW LONDON CONN

SURVEY OF SOUND PRESSURE LEVEL OF U.S.S.  
NAUTILUS.

(U)

DESCRIPTIVE NOTE: MEMORANDUM REPT.,  
FEB 56 12P MARRIS, J. DONALD ;  
REPT. NU. SBNL-MEMO-56-4  
PROJ: NAVMED-NM-003-041-56  
TASK: NM-003-041-56-08

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SUBMARINE NOISE,  
STRESS(PHYSIOLOGY)), SUBMARINE PERSONNEL,  
SPEECH, HEARING, INTELLIGIBILITY, HUMAN  
ENGINEERING

(U)

IDENTIFIERS: HABITABILITY

(U)

STUDIES WERE CONDUCTED TO ASCERTAIN WHETHER THE  
NOISE LEVEL OF A NEW TYPE SUBMARINE WOULD BE  
INCOMPATIBLE WITH PERSONNEL HABITABILITY, INTERFERE  
WITH SPEECH COMMUNICATION OR CAUSE AUDITORY DAMAGE.  
WHILE CERTAIN SPACES WITHIN THE SHIP WERE  
CLASSIFIED AS 'VERY NOISY', STILL, THE NOISE LEVEL WAS  
NOT SUFFICIENT TO CAUSE AUDITORY DAMAGE. THE NOISE  
LEVELS FOUND WERE CONSIDERABLY BELOW SAFETY LIMITS  
SET BY ANY NATIONALLY KNOWN GROUP. IN ENGINEROOM  
WORKSPACES, THE SPEECH INTERFERENCE LEVEL WAS ALWAYS  
LOW ENOUGH TO RENDER SPEECH INTELLIGIBLE OVER A  
DISTANCE OF A COUPLE OF FEET. IN OTHER WORKSPACES,  
NOISES WERE NOT INTENSE ENOUGH TO DETERIORATE SPEECH  
BEYOND REASONABLE LIMITS TO REDUCE HABITABILITY IN  
GENERAL. THERE IS NO INDICATION THAT SERVICE  
ABOARD VESSELS OF THIS TYPE WOULD CAUSE DAMAGE TO  
HEARING, OR BE UNDULY UNCOMFORTABLE. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-663 625 5/5 13/10.1  
NAVAL SUBMARINE BASE NEW LONDON CONN

THE HABITABILITY PROGRAM FOR SUBMARINES, AIRSHIPS AND  
CERTAIN OTHER LONG DURATION MILITARY TASK UNITS;  
PRINCIPLES OF ANALYSIS. (U)

DESCRIPTIVE NOTE: MEMORANDUM REPT.,  
JUN 57 6P FARNSWORTH, DEAN :  
REPT. NO. SBHL-MEMO-57-2  
PROJ: NAVMED-22-U2-2U

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPORT ON THE ANNUAL NUCLEAR  
SCIENCES SEMINAR (5TH), BROOKHAVEN NATIONAL  
LABORATORY.

DESCRIPTIONS: (HUMAN ENGINEERING, SUBMARINES).  
SUBMARINE PERSONNEL, EFFICIENCY, MORALE, COLORS,  
DESIGN, LIGHTING EQUIPMENT, RECREATION (U)  
IDENTIFIERS: HABITABILITY (U)

THE PURPOSE OF HABITABILITY PROGRAMS IS, IN  
GENERAL, TO INCREASE THE EFFICIENCY OF THE PERSONNEL.  
SPECIFICALLY: (1) TO INCREASE THE GENERAL  
PHYSICAL AND MENTAL WELL-BEING OF THE PERSONNEL BY  
PROVIDING PHYSICAL ARRANGEMENTS WHICH ENABLE THEM TO  
SLEEP RESTFULLY, EAT WITH SATISFACTION, WORK WITH  
CONFIDENCE AND RELAX WITH EASE. (2) TO PROMOTE  
A STATE OF MIND WHICH CAUSES THE PERSONNEL TO  
ANTICIPATE A RETURN TO CRUISE DUTY WITH AGREEABILITY  
OR WITH PLEASURE. (3) TO MINIMIZE, AS FAR AS  
CONSISTENT WITH OPERATIONAL EFFICIENCY, DECIDED  
DIFFERENCES BETWEEN THE HABITS AND CUSTOMS  
ESTABLISHED BY FIFTEEN TO TWENTY YEARS OF AMERICAN  
HOME LIFE AND THE LIVING CONDITIONS ABOARD A SHIP.  
(4) TO INCREASE THE SATISFACTION OF EACH  
INDIVIDUAL WITH HIS OWN WORK AND STIMULATE PRIDE IN  
HIS PARTICULAR SHIP. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-663 634 6/17 6/7  
NAVAL SUBMARINE BASE NEW LONDON CUNN

EVALUATION FOR SERVICE USE OF A PROTO-TYPE SWIMMER'S  
RESUE SUIT. (U)

DESCRIPTIVE NOTE: MEMORANDUM REPT.,  
MAK 58 IJP KENTSCH, SAMUEL B., JR;  
REPT. NO. SBNL-MEMO-58-1  
PROJ: NAVMED-NM-21-01-20.01  
TASK: NM-21-U1-20.01-01

UNCLASSIFIED REPORT

DESCRIPTORS: (SEA RESCUES, UNDERWATER CLOTHING),  
(UNDERWATER CLOTHING,  
PERFORMANCE(ENGINEERING)), SWIMMING, DIVING,  
EFFECTIVENESS, BREATHING APPARATUS,  
MOISTUREPROOFING, BUOYANCY, THERMAL INSULATION,  
ELASTICITY, ACCEPTABILITY (U)

THE INVESTIGATION WAS ONE OF A SERIES OF TESTS AND  
EVALUATIONS OF PROTOTYPE RESCUE (SWIM) SUITS  
CONDUCTED BY NAMRL IN COOPERATION WITH THE  
RESEARCH SECTION OF THE NAVAL CLOTHING  
SUPPLY OFFICE, BROOKLYN. THE SUIT WAS TRIED  
OUT UNDER SERVICE OPERATING CONDITIONS DURING  
EXERCISES ABOARD TWO SUBMARINE RESCUE AND SALVAGE  
VESSELS (ASH'S 15 AND 16) DURING JUNE AND  
JULY 1957 AND JANUARY 1958. THE SCOPE OF THE  
EVALUATIONS INCLUDED SWIMMING, SURFACE DIVING,  
FLOATING, SIMULATED RESCUING OF PERSONNEL, AND USE  
WITH AN AQUA LUNG FOR SUCH PURPOSES AS EXAMINING THE  
BOTTOM OF SHIPS, CHECKING ANCHOR CHAINS FOR FOULING,  
AND FOR TAKING UNDERWATER PICTURES. A NUMBER OF  
FAVORABLE FEATURES WERE NOTED--WATERPROOFNESS,  
BUOYANCY, WARMTH, AND A NUMBER OF UNFAVORABLE  
FEATURES WERE TABULATED FOR USE IN MODIFICATION OF  
THESE SUITS, SUCH AS POOR LOCATIONS OF THE FLUTTER  
VALVE AND THE CHIN SEGMENT OF THE FACE OPENING. IT  
WAS DIFFICULT TO GET INTO THE SUIT AND TOOK TOO LONG  
A TIME, AND THE MATERIAL WAS SO LIMITED IN ELASTICITY  
AS TO CAUSE DISCOMFORT. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-663 057 13/1 13/10.1 S/S  
NAVAL SUBMARINE BASE NEW LONDON CONN

A PHOTOMETRIC SURVEY OF THE RED LIGHTING INSTALLATION  
ON THE SUBMARINE U.S.S. CAVALLA (SS-244), CONVERTED  
TO K-2. (U)

DESCRIPTIVE NOTE: MEMORANDUM REPT.

SEP 53 6P  
REPT. NO. SBML-MHO-53-12  
PROJ: NAVMED-NM-UU2-U14-U1

UNCLASSIFIED REPORT

DESCRIPTORS: (LIGHTING EQUIPMENT, SUBMARINES),  
ILLUMINATION, HUMAN ENGINEERING, CALIBRATION,

SPECIFICATIONS (U)

IDENTIFIERS: SS 244 (U)

THE PHOTOMETRIC SURVEY OF THE RED ILLUMINATION IN  
THE SS-244 WAS CONDUCTED ON THE NIGHT OF 28-29  
AUGUST 1953. READINGS WERE MADE WITH A MACBETH  
ILLUMINUMETER AND CALIBRATED ACCESSORY DEVICES. (U)

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UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-663 694 13/10 5/2  
BUREAU OF SHIPS WASHINGTON D C

DIVING MANUAL.

(U)

JUL 52 167P  
REPT. NO. NAVSHIPS-250-880

UNCLASSIFIED REPORT

DESCRIPTORS: (•DIVING, HANDBOOKS), PHYSIOLOGY,  
PHYSICS, CONFINED ENVIRONMENTS, NAVAL EQUIPMENT,  
NAVAL RESEARCH, DECOMPRESSION SICKNESS,  
DECOMPRESSION, HELIUM, TABLES, COMPRESSED AIR,  
UNDERWATER EQUIPMENT, UNDERWATER CLOTHING,  
UNDERWATER VEHICLES, OCEANOGRAPHIC EQUIPMENT,  
INSTRUCTION MANUALS

(U)

IDENTIFIERS: MANNED SUBMERSIBLES

(U)

THE MANUAL SUPersedes THE 1943 EDITION OF THE  
DIVING MANUAL, AND SUPPLEMENTS THE INSTRUCTIONS  
GIVEN IN BUREAU OF SHIPS MANUAL, CHAPTER 94,  
SALVAGE; SECTION II, DIVING. IT CONTAINS  
INFORMATION IN REGARD TO THE PHYSIOLOGICAL ASPECTS OF  
DIVING WHICH ARE NOT INCLUDED IN CHAPTER 94 OF THE  
BUREAU OF SHIPS MANUAL. THE ADDITIONAL  
INSTRUCTIONS ARE GIVEN IN THE MANUAL FOR THE  
PURPOSE OF TRAINING PERSONNEL.

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-664 645 13/10.1 3/5 13/1  
NAVAL SUBMARINE BASE NEW LONDON CONN

PHOTOMETRIC SURVEY OF THE RED LIGHTING INSTALLATION  
ON THE USS SHORNFISH (SSN574). (U)

DESCRIPTIVE NOTE: MEMO. REPT.

UCT SG 1SP  
REPT. NO. SBHL-MCHU-58-12  
PROJ: NAVMED-NM-22-04-20-01  
TASK: NM-22-U2-2U.J1-03

UNCLASSIFIED REPORT

DESCRIPTORS: (LIGHTING EQUIPMENT, \*SUBMARINES),  
NUCLEAR POWERED VESSELS, SUBMARINE PERSONNEL,  
VISION, ADAPTATION(PHYSIOLOGY), ILLUMINATION,  
MILITARY REQUIREMENTS, HUMAN ENGINEERING,  
LEAKAGE(ELECTRICAL), PHOTOMETERS (U)

IDENTIFIERS: SSN 579, REU LIGHTS (U)

THE RED LIGHTING INSTALLATION OF THE U.S.S.  
SHORNFISH WAS SURVEYED WITH A VIEW TO DETERMINING  
THE ADEQUACY OF THE INSTALLATION TO PROVIDE FOR  
SUBSEQUENT DARK ADAPTATION OF THE CREW. IN  
GENERAL, ILLUMINATION WAS EVENLY DISTRIBUTED AND  
ADEQUATE FOR NORMAL OPERATIONS. THE GENERAL LEVEL  
OF ILLUMINATION WAS CONSIDERED TO BE SOMEWHAT TOO  
HIGH. SPECIFIC DISCREPANCIES ARE NOTED, THE MOST  
CONSTANT ONE BEING THE TENDENCY FOR THE JF330  
LIGHTING FEATURES TO LEAK WHITE LIGHT AT BOTH ENDS.  
(AUTHUR) (U)

UNCLASSIFIED

UDL REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AUD665 000 0/1  
SCRIPPS INSTITUTION OF OCEANOGRAPHY LA JOLLA CALIF

ECOLOGICAL STUDIES DURING PROJECT SEALAB II, (U)

FEB 00 1968 CLARKE, THOMAS A.; FLECHSIG,  
ARTHUR U.; FURIGA, RICHARD W.;  
CONTRACT: NONR-2216(33)  
PROJ: NR-083-005

UNCLASSIFIED REPORT  
AVAILABILITY: PUBLISHED IN SCIENCE, V157 N3795  
P1381-9 SEP 22 1967.

DESCRIPTORS: (•MARINE BIOLOGY, ECOLOGY),  
(•UNDERWATER VEHICLES, ECOLOGY), UNDERWATER  
EQUIPMENT, ENVIRONMENTAL TESTS, LABORATORIES,  
PLANKTON, OCEAN BOTTOM SAMPLING, NUTRITION,  
PERFORMANCE(HUMAN), INVERTEBRATES, AQUATIC  
ANIMALS, DISTRIBUTION, PERIODIC VARIATIONS, DEEP  
SUBMERGENCE (U)  
IDENTIFIERS: SEALAB II, MANNED SUBMERSIBLES (U)

THE MAIN PURPOSE OF THE PROJECT WAS TO EVALUATE THE  
PERFORMANCE OF MEN AND EQUIPMENT IN A HIGH-PRESSURE,  
UNDERWATER ENVIRONMENT (1). SEALAB II, AN  
UNDERWATER HABITAT, WAS PLACED ON THE BOTTOM FOR 45  
DAYS. DURING THIS TIME STUDIES WERE MADE OF THE  
ECOLOGY OF THE SAND BOTTOM AROUND THE SITE AND  
OBSERVED ON A DAY-BY-DAY BASIS THE ORGANISMS  
ATTRACTED TO THE SITE AS WELL AS ABUNDANCES,  
BEHAVIOR, AND FOOD HABITS. MOST OF OUR  
OBSERVATIONS WERE OF AREAS ADJACENT TO SEALAB II.  
(AUTHOR) (U)

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VOL REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AUT660 18U 15/7 5/10  
CALIFORNIA UNIV LOS ANGELES BIOTECHNOLOGY LAB

UNDERWATER WORK MEASUREMENT TECHNIQUES: INITIAL STUDIES. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
MAR 60 IUSP ELMAN, GERSHON EGSTROM,  
GLEN M. IELLIOTT, ROBERT E. STEVENSON, HERBERT  
S.;  
REPT. NO. TR-44, 68-11  
CONTRACT: NODD14-67-A-0111  
PROJ: HK-146-U69

UNCLASSIFIED REPORT

DESCRIPTIONS: (+PERFORMANCE(HUMAN), UNDERWATER), (+DIVING, PERFORMANCE(HUMAN)), BIOMETRY, DATA PROCESSING SYSTEMS, EFFECTIVENESS, CONSTRUCTION, MODELS(SIMULATIONS), RESEARCH, PROGRAM ADMINISTRATION, TEST METHODS, CLASSIFICATION, CLOSED CIRCUIT TELEVISION, RECORDING SYSTEMS, ARMS, LEGS, STRESS(PHYSIOLOGY), RESPIRATION, ELECTRUCARDIOGRAPHY, SPACE ENVIRONMENTAL CONDITIONS, STRESS(PSYCHOLOGY), OCEAN BOTTOM, TABLES (U)  
IDENTIFIERS: WORK MEASUREMENT(UNDERWATER), (U)  
GRAPHS(CHARTS) (U)

THE REPORT REVIEWS INITIAL PROGRESS IN AN ONGOING STUDY OF UNDERWATER WORK MEASUREMENT. THE OBJECTIVE OF THE STUDY IS TO DETERMINE NEW WAYS OF DEFINING AND MEASURING DIVING WORK EFFECTIVENESS, AND TO DEVELOP MEASUREMENT TECHNIQUES FOR GENERAL APPLICATION IN RESEARCH AND OPERATIONAL PROGRAMS. EXAMINATION OF MEASUREMENT TECHNIQUES WAS DIVIDED INTO THREE MAIN AREAS: PROCEDURAL, PHYSIOLOGICAL AND PSYCHOLOGICAL. THE REPORT DESCRIBES THE DEVELOPMENT OF A PIPE CONSTRUCTION TASK AND A LABORATORY INSTRUMENTATION SYSTEM. IN ADDITION, IT PRESENTS THE RESULTS OF A SERIES OF SUB-STUDIES DEALING WITH WORK METHODOLOGY AND PHYSIOLOGICAL RESPONSE UNDERWATER. THE STUDIES WERE CONDUCTED IN THE DIVING TANK OF THE UCLA UNDERWATER RESEARCH FACILITY. A SUMMARY OF FINDINGS AND RECOMMENDATIONS IS INCLUDED. (AUTHOR) (U)

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LUL REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AU-664 512 5/10 13/10 6/14  
NORTH AMERICAN ROCKWELL CORP DOWNEY CALIF SPACE DIV

STUDY OF WORK-PRODUCING CHARACTERISTICS OF UNDERWATER OPERATIONS. (U)

DESCRIPTIVE NOTE: FINAL REPT. IS MAY 67-14 MAY 68,  
MAY 68 3YP STHEIMER,I. ;TURNER,U. P.

W. VULKMER,R. I.

REPT. NO. SD-68-347

CONTRACT: NUUU14-67-L-0363

TASK: NH-196-070

UNCLASSIFIED REPORT

DESCRIPTIONS: (SCUBA DIVERS, PERFORMANCE TESTS),  
UNDERWATER, ENVIRONMENTAL TESTS, MARINE  
ENGINEERING, PERFORMANCE(HUMAN), CORRELATION  
TECHNIQUES, TERRAIN, BIOMEIRY, TEST METHODS,  
SEQUENCES, SENSORS, ELECTROCARDIOGRAPHY, SKIN,  
TEMPERATURE, THERMISTORS, ANTHROPOMETRY,  
TABLES (U)

THE WORK OUTPUT CHARACTERISTICS OF DIVERS WERE  
TESTED DURING THE PERFORMANCE OF MANUAL TASKS WHICH  
GENERALLY FELL INTO THREE CLASSIFICATIONS: (1)  
A COMPLEX MAINTENANCE TASK INVOLVING THE  
DISASSEMBLY AND REASSEMBLY OF A WATER FILTRATION  
UNIT. (2) A SIMPLE REPETITIVE ROTARY TASK  
REQUIRING CONTINUOUS TORQUE PRODUCTION AGAINST KNOWN  
RESISTANCES. (3) A SIMPLE REPETITIVE  
DISCONTINUOUS FLEXION/EXTENSION TASK REQUIRING THE  
EXERTION OF LINEAR FORCES AGAINST KNOWN RESISTANCES.  
DURING THE TASK EXECUTION, HEART RATE AND THREE  
SKIN TEMPERATURES WERE CONTINUOUSLY MONITORED AND  
ELECTRONICALLY RECORDED. THE UNDERWATER RESULTS  
WERE COMPARED WITH PERFORMANCE VALUES OBTAINED FROM  
THESE TASKS EXECUTED IN NORMALLY TRACTIVE "DRY"  
ENVIRONMENTS AND THE OBSERVED DECREMENTS DISCUSSED IN  
TERMS OF BIOMECHANICAL CONSIDERATIONS AND CERTAIN  
WATER EFFECTS. (AUTHOR) (U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CUNTHUL NO. /ZMK23

AU-67U UCI 6/14  
DUNLAP AND ASSOCIATES INC DARIEN CONN

DIVER PERFORMANCE AND THE EFFECTS OF COLD. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
JUL 67 40P BOWE, HUGH M.;  
REPT. NO. 05067-441  
CONTRACT: AG0014-67-C-0263

UNCLASSIFIED REPORT

DESCRIPTION: (DIVING, STRESS(PHYSIOLOGY)),  
PERFORMANCE(HUMAN), COLD WEATHER TESTS, BODY  
TEMPERATURE, TOLERANCES(PHYSIOLOGY), PERFORMANCE  
TESTS, TOUCH, STRENGTH, MEASURING, PROBLEM  
SOLVING, MEMORY, PSYCHOMOTOR TESTS, SCUBA DIVERS (U)

THE CAPABILITY OF DIVERS WAS TESTED BY A TEST  
BATTERY COMPRISING TESTS OF TACTILE SENSITIVITY, GRIP  
STRENGTH, MANUAL DEXTERITY, TRACKING, ASSEMBLY OF A  
STRUCTURE BY GROUPS, MENTAL ARITHMETIC, SYMBOL  
PROCESSING, SIMPLE PROBLEM SOLVING AND MEMORY. AT  
A DIVING FORK AND A FLUODED QUARRY TEST DATA WAS  
COLLECTED FOR PERFORMANCE ON DRY LAND (CONTROL)  
AND AT WATER TEMPERATURES OF 72F., 62F., AND  
47F. POST-DIVE URINE TEMPERATURES AND A LIMITED  
SAMPLE OF SKIN TEMPERATURES WERE RECORDED. DIVERS  
WORE A COMPLETE 3/16 IN. NEOPRENE SUIT, EXCEPT THAT DURING  
THE TESTS, THE HANDS WERE BARE. THE RESULTS  
SHOW: HAND IMPAIRMENT--LOSSES IN TACTILE  
SENSITIVITY, GRIP STRENGTH, AND MANUAL MOVEMENT; THE  
LOSSES WERE PROPORTIONAL TO DEGREE OF COLD AND  
EXPOSURE TIME; THE LOSSES FOLLOW A SIMILAR COURSE TO  
SKIN TEMPERATURE DECREASE AND HENCE ARE CONSIDERED  
DUE MAINLY TO PERIPHERAL PHYSIOLOGICAL  
ATTENUATIONS; PSYCHOMOTOR IMPAIRMENT--LOSSES IN  
MANUAL DEXTERITY, TRACKING, AND GROUP ASSEMBLY WERE  
PROPORTIONATE TO WATER TEMPERATURE; MENTAL  
IMPAIRMENT--LOSSES IN MENTAL CAPABILITY OCCURRED IN  
THOSE CASES WHERE THE TASK REQUIRED INTENSE ATTENTION  
AND INVOLVED CONSIDERABLE SHORT TERM MEMORY;  
"BLOCKING" EFFECTS OCCURRED AT THE LOWER  
TEMPERATURES. THE CAUSES OF THE LOSSES IN  
CAPABILITY ARE DISCUSSED IN TERMS OF PERIPHERAL AND  
CENTRAL IMPAIRMENTS, IN TERMS OF "WATER" EFFECTS AND  
"COLD" EFFECTS, AND IN TERMS OF A HYPOTHESIS THAT  
IMMERSION IN COLD WATER SERVES TO DISTRACT THE DIVER.  
PRACTICAL AND THEORETICAL IMPLICATIONS OF THE STUDY  
ARE REVIEWED. (AUTHOR) (U)

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ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK2J

AD-673 246 5/9 17/9  
UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF  
PSYCHOLOGY

THE ASSESSMENT OF ELECTRONICS CORRECTIVE MAINTENANCE  
PERFORMANCE: II. PERFORMANCE ON THE AN/SPS-40 BY  
ELECTRONICS TECHNICIANS. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
JUL 68 110P RIGNEY, JOSEPH W.  
REPT. NO. TR-60  
CONTRACT: N0001-228(22)  
PROJ: NK-153-U93

UNCLASSIFIED REPORT

DESCRIPTORS: (\*ELECTRONIC TECHNICIANS,  
PERFORMANCE(HUMAN)), (\*RADAR EQUIPMENT,  
MAINTAINABILITY), SHIPBORNE, NAVAL EQUIPMENT,  
NAVAL PERSONNEL, MILITARY TRAINING, MAINTENANCE,  
SAMPLING (U)  
IDENTIFIERS: AN/SPS-40, TROUBLESHOOTING (U)

CORRECTIVE MAINTENANCE INCLUDES SYSTEM STATE  
RECOGNITION, FAULT LOCALIZATION AND FAULT ISOLATION  
TASKS. EIGHT PERFORMANCE TESTS INCORPORATING THESE  
CRITERION TASKS WERE DEVELOPED FOR THE AN/SPS-40  
RADAR, AND ADMINISTERED TO A SAMPLE OF FOURTEEN  
SHIPBOARD NAVY ETS WHO HAD RECEIVED C SCHOOL  
TRAINING IN THIS EQUIPMENT, AND WHO WERE RESPONSIBLE  
FOR MAINTAINING IT ABOARD THEIR RESPECTIVE SHIPS.  
THE TESTS WERE MEASURES OF SKILLS NECESSARY FOR THE  
PERFORMANCE OF THE CRITERION TASKS, AND THEY PROVIDED  
SCORES WHICH WERE MEASURES OF SUCCESS ON EACH OF  
THESE TASKS. THEY ALSO PROVIDED DIAGNOSTIC DATA ON  
THE VARIOUS SKILLS THAT YIELDED INFORMATION  
CONCERNING THE SOURCES OF POOR PERFORMANCE. THE  
TEST RESULTS SHOWED THAT THE ETS IN THE SAMPLE WERE  
GOOD IN PERFORMING DESIGNATED FRONT PANEL CHECKS AND  
IN MAKING NORMAL/ABNORMAL JUDGMENTS; THEY WERE  
MODERATELY WEAK IN SELECTING ADDITIONAL CHECKS FOR  
SYMPTOM ELABORATION; AND THEY WERE VERY POOR IN USING  
STANDARD TEST EQUIPMENT, IN PERFORMING SYSTEM CHECKS,  
AND IN ACCURATELY REDUCING FAULT AREAS. TRAINING  
RECOMMENDATIONS FOR THE IMPROVEMENT OF CORRECTIVE  
MAINTENANCE OF THE AN/SPS-40 ARE MADE. THESE  
RECOMMENDATIONS ARE BASED ON ANALYSES OF THE RESULTS  
OF THIS STUDY. (AUTHOR) (U)

UNCLASSIFIED

UDL REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AU-673 532 6/IV  
DEEP SUBMERGENCE SYSTEMS PROJECT TECHNICAL OFFICE SAN  
DIEGO CALIF

RESULTS OF PHYSIOLOGIC STUDIES CONDUCTED DURING  
CHAMBER SATURATION DIVES FROM 200 FEET TO 825 FEET.  
A PRELIMINARY REPORT. (U)

DESCRIPTIVE NOTE: RESEARCH REPT.,  
MAY 60 BUP BRADLEY, MARK E.; VURUSHARTI,  
JAMES ILLIA-EAVEN, PAUL W. MAZZONE, WALTER F.

REPT. NO. USSP-TU-MR-1-60  
PROJ: 54607-UU1  
TASK: 11097

UNCLASSIFIED REPORT

DESCRIPTIONS: (DIVING, STRESS(PHYSIOLOGY)),  
DEEP SUBMERGENCE, PRESSURE BREATHING, HELIUM,  
OXYGEN, EXERCISE, PSYCHOPHYSIOLOGY, HEMATOLOGY,  
BLOOD CHEMISTRY, CARDIOVASCULAR SYSTEM,  
PSYCHOMETRICS, PERFORMANCE(HUMAN), LUNGS,  
RESPIRATION, MOTOR REACTIONS (U)  
IDENTIFIERS: AQUANAUTS, SEALAB 3 (U)

FROM FEBRUARY 1967 TO MAY 1968, A SERIES OF  
SATURATION DIVES WAS CONDUCTED AT THE U.S. NAVY  
EXPERIMENTAL DIVING UNIT. THESE DIVES WERE  
DESIGNED TO TRAIN AND SELECT AQUANAUTS FOR THE OPEN  
SEA SEALAB III EXPERIMENTS AS WELL AS TO MEASURE  
THE PSYCHOPHYSIOLOGICAL EFFECTS ON MAN'S ABILITY TO  
WORK AT GREAT DEPTHS. A WIDE VARIETY OF  
HEMATOLOGICAL, BIUCHEMICAL, CARDIOPULMONARY AND  
PSYCHOMETRIC STUDIES WERE MADE TO DETERMINE WHETHER  
CHANGES OCCURRED DURING EXPOSURES TO HELIUM-OXYGEN  
ATMOSPHERES AT GREAT DEPTHS. THE DATA IN THIS  
PRELIMINARY REPORT WAS OBTAINED DURING 14 SATURATION  
DIVES, RANGING IN DEPTH FROM 200 FEET TO 825 FEET.  
PSYCHOLOGICAL STUDIES WERE CONDUCTED DURING "WET"  
EXCURSION DIVES TO DEPTHS OF 300, 825 AND 1025 FEET.  
OVER 25,000 BIOMEDICAL OBSERVATIONS AND  
MEASUREMENTS WERE OBTAINED IN THE COURSE OF THESE  
DIVES. IN GENERAL THE RESULTS INDICATE THAT MAN  
CAN EFFECTIVELY, SAFELY WORK AT DEPTHS UP TO 825 FEET  
SATURATED. SOME DECAYMENT IN COGNITIVE AND  
NEUROUSCULAR ABILITY WAS FOUND AS WELL AS IN CERTAIN  
PULMONARY VENTILATORY PARAMETERS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AU-674 528 5/9 6/11 6/14  
GENERAL DYNAMICS CORP GHUTON CONN ELECTRIC BOAT DIV

DIVER PERFORMANCE MEASUREMENT: UNDERWATER NAVIGATION  
DEPTH MAINTENANCE WEIGHT CARRYING CAPABILITIES. (U)

DESCRIPTIVE NOTE: ANNUAL TECHNICAL REPT. MAR 67-MAR  
68,

JUL 68 46P ANUENSEN,BIRGER G. ;  
REPT. NO. U-417-68-030  
CONTRACT: NOU14-67-C-0447  
PHOJ: NR-196-068

UNCLASSIFIED REPORT

DESCRIPTIONS: (•SCUBA DIVERS, PERFORMANCE TESTS),  
BUOYANCY, WEIGHT, INSTRUMENTATION, BREATHING  
APPARATUS, TEST FACILITIES, ENVIRONMENTAL TESTS,  
DESIGN, DATA TRANSMISSION SYSTEMS, MONITORS,  
DATA PROCESSING SYSTEMS, AIR, UNDERWATER  
NAVIGATION, PERFORMANCE(HUMAN), PHYSIOLOGY (U)

UNDERWATER MEASUREMENT TECHNIQUES WERE DEVELOPED  
AND APPLIED TO TEST THE CAPABILITIES AND LIMITATIONS  
OF FREE-SHIMMING SCUBA DIVERS IN TRANSPORTING OBJECTS  
WITH VARYING DEGREES OF NEGATIVE BUOYANCY; AND TO  
DETERMINE THE EFFECTS OF WEIGHT LOCATION ON  
PERFORMANCE. THE CONDITIONS OF NEGATIVE BUOYANCY  
CONSISTED OF 3-POUND, 6-POUND, AND 9-POUND WEIGHTS,  
EITHER ATTACHED TO THE DIVER'S BODY OR HANDHELD BY  
THE DIVER. QUANTITATIVE DATA WAS OBTAINED USING A  
DIVER COMMUNICATION/TELEMETRY SYSTEM. THE MEASURES  
OF DIVER PERFORMANCE RECORDED INCLUDED: DIVER  
DEPTH, AIR CONSUMPTION RATE, SWIMMING SPEED, AND  
NAVIGATIONAL ACCURACY. THE TESTS WERE PERFORMED IN  
WATER 32 FEET DEEP OVER A 780-FOOT UNDERWATER TEST  
RANGE. THE CAUSES FOR RESULTING PERFORMANCE  
DECREMENTS ARE DISCUSSED IN TERMS OF WEIGHT AND  
WEIGHT LOCATION EFFECTS. PRACTICAL IMPLICATIONS OF  
THE STUDY RESULTS ARE REVIEWED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-675 200 14/2 5/9 5/5  
PSYCHOLOGICAL RESEARCH ASSOCIATES INC ARLINGTON VA

LAYOUT AND DESIGN CONSIDERATIONS OF RS-6 CONTROL  
CONSOLES.

(U)

DESCRIPTIVE NOTE: MEMORANDUM REPT.,  
FEB 56 43P BARKER, WILLIAM S. BOLDER,  
HARRY J. ;  
REPT. NO. PRA-56-1  
CONTRACT: NONR-1415(U)

UNCLASSIFIED REPORT

DESCRIPTIONS: (DISPLAY SYSTEMS, HUMAN  
ENGINEERING), (UNDERSEA WARFARE, TRAINING  
DEVICES), (TRAINING DEVICES, CONTROL PANELS),  
MODIFICATION KITS, DESIGN, STANDARDIZATION,  
SUBMARINE PERSONNEL, STUDENTS, NAVAL TRAINING,  
INSTRUCTORS, PLAN POSITION INDICATORS, MAINTENANCE  
PERSONNEL, ROTARY SWITCHES, LATITUDE RAY TUBES,  
PANEL BOARDS(ELECTRICITY), RADIO SONIC BUOYS,  
SUBMARINE MODELS, AIRPLANE MODELS, COMMUNICATION  
SYSTEMS, NAVAL OPERATIONS, NAVAL SHORE  
ESTABLISHMENTS

(U)

THIS REPORT CONTAINS A HUMAN ENGINEERING EVALUATION  
OF TRAINING DEVICES USED IN MODERN SUBMARINE WARFARE  
TACTICAL TRAINING.

(U)

UNCLASSIFIED

UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-677 U96 5/5 22/1  
GENERAL DYNAMICS/ASTRONAUTICS SAN DIEGO CALIF

AN OUTLINE OF HUMAN ENGINEERING METHODS AND  
INFORMATION INCLUDING MAN-IN-SPACE  
CONSIDERATIONS.

(U)

OCT 60 2JP MULESKO: NO. 1  
REPT. NO. GDA-KEL-R-U37

UNCLASSIFIED REPORT

DESCRIPTORS: (+SPACE MAINTENANCE, +HUMAN  
ENGINEERING), (+EXTRAVEHICULAR ACTIVITY, SPACE  
MAINTENANCE), SPACE CREWS, SPACE ENVIRONMENTAL  
CONDITIONS, MAN-MACHINE SYSTEMS, COMMUNICATION  
SYSTEMS, CONTROL PANELS, ILLUMINATION, DISPLAY  
SYSTEMS, TELEVISION COMMUNICATION SYSTEMS,  
STANDARDIZATION, CODING, SENSORY MECHANISMS,  
MOTOR REACTIONS, CLOTHING, BEHAVIOR, NUTRITION,  
DRUGS

(U)

THE MATERIAL IN THE OUTLINE IS INTENDED TO SERVE AS  
A GUIDE AND SOURCE OF INFORMATION TO PERSONNEL WHO  
MAY HAVE PROBLEMS REQUIRING THE APPLICATION OF HUMAN  
ENGINEERING TECHNIQUES. IT IS INTENDED TO INDICATE  
THE VARIETY OF PROBLEMS FOR WHICH HUMAN ENGINEERING  
METHODS AND INFORMATION EXIST TO PROVIDE ASSISTANCE.  
(AUTHOR)

(U)

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/ZHK23

UNCLASSIFIED

UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AD-670 840 8/14 8/1  
NAVAL SUBMARINE MEDICAL CENTER GROTON CONN SUBMARINE  
MEDICAL RESEARCH LAB

SATURATION-EXCURSION DIVING: BIOCHEMICAL CYCLE  
FUNCTIONS IN LACTIC DEHYDROGENASE, LACTATE, AND  
PYRUVATE RESPONSES,

(U)

JUN 68 12P SCHAEFER, KARL E.; JACEY,  
MICHAEL J.; CAREY, CHARLES R.; MAZZONE, W. F.

i

REPT. NO. SMRL-536  
MUNITUR: NAVMED MHDUS.04-U063-2

UNCLASSIFIED REPORT  
AVAILABILITY: PUB. IN AEROSPACE MEDICINE, V39 N4  
P343-350 APR 68.

DESCRIPTIONS: (•DIVING, •METABOLISM), PRESSURE  
BREATHING, OXIDOREDUCTASES, LACTATES, PYRUVATES,  
HIGH-PRESSURE RESEARCH, UNDERWATER VEHICLES, DEEP  
SUBMERGENCE

(U)

IDENTIFIERS: METABOLIC CYCLES, LACTIC  
DEHYDROGENASES, SEALAB 2

(U)

AS PART OF A GENERAL PREPARATORY PROGRAM FOR  
SEALAB II, SATURATION-EXCURSION DIVES WERE  
PERFORMED IN A DRY CHAMBER, USING COMPRESSED AIR.  
THE EXPERIMENTS WERE PERFORMED TO TEST A DIVING  
SCHEDULE FOR SATURATION-EXCURSION DIVES WITH  
COMPRESSED AIR, AND TO MONITOR RESPONSES OF  
PHYSIOLOGICAL FUNCTIONS TO THE HIGH PRESSURE  
ENVIRONMENT.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-680 028 S/10 15/7  
BIOTECHNOLOGY INC ARLINGTON VA

AN INTEGRATED MEASUREMENT SYSTEM FOR THE STUDY OF  
HUMAN PERFORMANCE IN THE UNDERWATER ENVIRONMENT. (U)

DEL 68 1009 HEILLY, RAYMOND E. (CAMERON,  
BERNARD J.;  
CONTRACT: N00014-67-C-0410  
PROJ: NH-196-U74

UNCLASSIFIED REPORT

DESCRIPTORS: (DEEP SUBMERGENCE,  
PERFORMANCE(HUMAN)), (PSYCHOMETRICS,  
UNDERWATER), DIVING, PSYCHOMOTOR TESTS,  
INTELLIGENCE TESTS, MOTOR REACTIONS,  
REACTION(PSYCHOLOGY), ENVIRONMENTAL TESTS,  
LOGIC CIRCUITS, DISPLAY SYSTEMS, TEST METHODS,  
ELECTRONIC EQUIPMENT (U)

THE REPORT DESCRIBED A SYSTEM TO MEASURE HUMAN  
MENTAL AND PERCEPTUAL-MOTOR FUNCTIONS AT AMBIENT  
PRESSURES OF UP TO 444 LB/IN SQUARED, EQUIVALENT TO A  
DEPTH OF 1000 FEET. DESIGNED FOR USE IN THE  
ENVIRONMENTAL CHAMBERS AT THE NAVY EXPERIMENTAL  
DIVING UNIT, THE SUBJECT'S EQUIPMENT WILL OPERATE  
IN WET OR DRY SURROUNDINGS. THE SYSTEM PERMITS  
REMOTE ADMINISTRATION AND SCORING OF 26 SPECIFIC  
TESTS RANGING FROM SIMPLE REACTION TIME TO COMPLEX  
MANUAL TRACKING, AND FROM MONITORING A SIMPLE DISPLAY  
TO SOLVING DIFFICULT MENTAL ARITHMETIC AND SYMBOLIC  
PROBLEMS. AS A FORMAL TEST BATTERY AND GENERAL  
RESEARCH TOOL, THE SYSTEM IS EXPECTED TO HAVE  
EXTENSIVE APPLICATION IN THE AREAS OF (1)  
SPECIFICATION OF HUMAN UNDERWATER PERFORMANCE  
CAPABILITIES, (2) DELINEATION OF FACTORS OF THE  
DIVING ENVIRONMENT WHICH AFFECT PERFORMANCE, AND  
(3) DEVELOPMENT OF DIVER SELECTION CRITERIA. (U)

(AUTHOR)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-68U 33/ 9/3 8/3 8/10 13/8U  
SCRIPPS INSTITUTION OF OCEANOGRAPHY SAN DIEGO CALIF MARINE  
PHYSICAL LAB

MAINTENANCE OF SEA-FLOOR ELECTRONICS (U)

NAME 68 11P ANDERSON, VICTOR C. I  
REPT. NO. MPL-U-63/67  
CONTRACT: NUNR-2416(US)  
PROJ: NR-200-1U3

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN IEEE TRANSACTIONS ON  
AEROSPACE AND ELECTRONIC SYSTEMS, VAES-4, NS P650-  
658 SEP 68.

SUPPLEMENTARY NOTE: PRESENTED AT 1967 EASTCON,  
WASHINGTON, D.C., 16-18 OCT 67.

DESCRIPTIONS: (ELECTRONIC EQUIPMENT, MAINTENANCE),  
(MAINTENANCE, UNDERWATER EQUIPMENT),  
POSITIONING DEVICES(MACHINERY), MAINTENANCE  
PERSONNEL, DIVING, REMOTE CONTROL SYSTEMS, COSTS.  
LABORATORIES, OCEANOLOGY (U)  
IDENTIFIERS: MANIPULATORS (U)

THIS PAPER DISCUSSES SOME OF THE PRESENT  
DEVELOPMENTS IN IN SITU ELECTRONICS MAINTENANCE BY  
THE USE OF DIVERS AND BY REMOTE MANIPULATORS, AND  
RELATES THE EFFECT OF THESE DEVELOPMENTS TO THE  
OPERATING COST OF FUTURE SEA-FLOOR INSTRUMENTATION  
SYSTEMS. (AUTHOR) (U)

90

UNCLASSIFIED

/ZHK23

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-684 47Y 6/17  
NAVAL MEDICAL RESEARCH INST BETHESDA MD

PHYSIOLOGICAL EVALUATION OF A FREE-FLOODING DIVER  
HEAT REPLACEMENT GARMENT. (U)

DESCRIPTIVE NOTE: MEDICAL RESEARCH INTERIM REPT.,  
FEB 69 IUP BONDI, KENNETH R.; TAUBER,  
JOHN F.  
MONITOR: NAVMEDU MF12-524-014-1004-17

UNCLASSIFIED REPORT

DESCRIPTIONS: (+DIVING, +PROTECTIVE CLOTHING),  
UNDERWATER CLOTHING, BODY TEMPERATURE, HEAT  
TRANSFER, RESPONSES, DESIGN, TEMPERATURE, WATER (U)

THE GENERAL CAPABILITIES OF A FREE-FLOODING HEAT  
REPLACEMENT GARMENT IN MAINTAINING THERMAL COMFORT IN  
40°F WATER, AT BOTH SURFACE AND DEEP DIVING  
CONDITIONS, ARE CONSIDERED. SUIT INLET AND OUTLET  
TEMPERATURE, FLOW RATE, SKIN AND RECTAL TEMPERATURES,  
AND DIVERS' SUBJECTIVE COMFORT LEVEL WERE RECORDED.  
SUIT INLET TEMPERATURES WHICH PRODUCE A SUBJECTIVE  
RESPONSE OF THERMAL COMFORT BY THE DIVER (COMFORT  
ZONE INLET TEMPERATURE) AT VARIOUS FLOW RATES  
ARE PRESENTED FOR SURFACE CONDITIONS AND THROUGH USE  
OF A HEAT BALANCE EQUATION, FOR DEPTH CONDITIONS.  
WHILE THE SUIT IS CONSIDERED INEFFICIENT BECAUSE OF  
ITS HIGH POWER REQUIREMENTS, ESPECIALLY AT DEPTH, ITS  
WEARABILITY AND MODE OF HEAT TRANSFER MAKE IT AN  
EXCELLENT HEAT REPLACEMENT GARMENT. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AU-684 170 20/0 6/16  
NAVAL SUBMARINE MEDICAL CENTER GROTON CT UNN SUBMARINE  
MEDICAL RESEARCH LAB

THE UNDERWATER VISIBILITY OF COLORS WITH ARTIFICIAL  
ILLUMINATION. (U)

UCT 68 14P RINNEY, JO ANN S.; LUNIAK,  
S. M.; WEITZMAN, DONALD C.  
REPT. NO. SMRL-551  
MONITOR: NAVMED MF12-524-004-90140-1

UNCLASSIFIED REPORT

DESCRIPTORS: (1)COLORS, UNDERWATER LIGHTS;  
(2)VISUAL PERCEPTION, UNDERWATER; VISIBILITY,  
MERCURY LAMPS, INCANDESCENT LAMPS, SCUBA DIVERS,  
CAMOUFLAGE, TEST METHODS, RIVERS, SEA WATER,  
TEST EQUIPMENT, TARGETS (U)

IDENTIFIERS: (1)UNDERWATER VISIBILITY,  
TURBIDITY (U)

THE VISIBILITY OF VARIOUS COLORS UNDERWATER WITH  
ARTIFICIAL ILLUMINATION HAS BEEN MEASURED IN THREE  
DIFFERENT BODIES OF WATER CHOSEN TO SAMPLE A  
CONTINUUM FROM CLEAR TO TURBID. SUBJECTS WERE  
SCUBA DIVERS WHO OBSERVED THE COLORS AT NIGHT,  
USING A MERCURY OR AND INCANDESCENT LIGHT SOURCE.  
THE VISIBILITY RESULTS SHOW NUMEROUS INTERACTIONS  
AMONG COLOR, FLUORESCENCE, TYPE OF LIGHT SOURCE, AND  
TYPE OF WATER; FROM THEM, IT IS POSSIBLE TO SELECT  
THE OPTIMUM COMBINATION TO BE USED UNDER A WIDE  
VARIETY OF CONDITIONS. COLORS ARE SPECIFIED THAT  
WILL (1) MAXIMIZE VISIBILITY, (2) PROVIDE THE  
BEST CAMOUFLAGE, AND (3) ALLOW DISTINCT COLOR  
DIFFERENCES IN APPEARANCE FOR USE IN COLOR CODING.  
THESE RESULTS ARE SUMMARIZED IN TERMS OF THE COLORS  
THAT ARE MOST EFFECTIVE FOR USE UNDER VARIOUS  
OPERATIONAL CONDITIONS ENCOUNTERED UNDERWATER.  
(AUTHOR) (U)

UNCLASSIFIED

UUC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-684 07: 5/10  
CALIFORNIA UNIV LOS ANGELES DEPT OF ENGINEERING

ADAPTATION OF DIVERS TO DISTORTION OF SIZE AND  
DISTANCE UNDERWATER. (U)

DESCRIPTIVE NOTE: BIOTECHNOLOGY LAB. TECHNICAL REPT.,  
JAN 69 3YP ROSS, HELEN E.; FRANKLIN,  
SAMUEL S.; WELTMAN, GERSHON;  
REPT. NO. IR-45, 68-01  
CONTRACT: NOU014-67-A-0111

UNCLASSIFIED REPORT

DESCRIPTORS: (•VISUAL PERCEPTION, UNDERWATER),  
(•LIVING, VISUAL PERCEPTION),  
ADAPTATION(PHYSIOLOGY),  
ADJUSTMENT(PSYCHOLOGY), PERFORMANCE(HUMAN),  
SPACE PERCEPTION, DISTORTION (U)

THIS REPORT DESCRIBES A SERIES OF FIVE EXPERIMENTS CONDUCTED DURING SUMMER 1968 TO EXAMINE ADAPTATION OF DIVERS TO SIZE AND DISTANCE DISTORTION UNDERWATER. VISUALLY PERCEIVED DISTORTIONS OF SIZE AND DISTANCE ARE PRODUCED BY THE DIVER'S FACEMASK WHICH INTRODUCES AN AIR-WATER INTERFACE BETWEEN THE EYE AND THE OBJECT OF REGARD. THE EFFECT OF THIS INTERFACE IS TO DECREASE IMAGE DISTANCE BY ABOUT ONE-FOURTH. UNDER THESE CONDITIONS OBJECTS ARE LIKELY TO BE REPORTED AS CLOSER OR LARGER, OR CLOSER AND LARGER THAN THEY ACTUALLY ARE. ADAPTATION TO DISTORTIONS OF SIZE AND DISTANCE WERE INVESTIGATED BY TWO TECHNIQUES: (1) THE METHOD OF ADJUSTMENT WHERE A DIVER ADJUSTED THE SIZE OF A HORIZONTAL LINE, SET IN THE FRONTAL PLANE AT A FIXED DISTANCE, TO A LENGTH OF 12 INCHES; (2) THE METHOD OF ESTIMATION WHERE THE DIVER RECORDED HIS JUDGMENTS OF THE SIZE AND DISTANCE OF A SERIES OF TARGETS WHICH VARIED ON THESE DIMENSIONS. OF THE FIVE EXPERIMENTS CONDUCTED IN THE UNDERWATER RESEARCH FACILITY TANK AND SWIMMING POOL AT UCLA AND IN THE OCEAN, THREE WERE SUCCESSFUL IN DEMONSTRATING ADAPTATION.

(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-686 174 5/9  
NAVAL TRAINING DEVICE CENTER ORLANDO FLA

ANNUTATED BIBLIOGRAPHY OF HUMAN FACTORS LABORATORY  
REPORTS (1945-1968). (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
FEB 64 376P KURTZ, ALBERT K. ISMITH,  
MARY C.;  
REPT. NO. NAVTRADEVCE I-IN-158

UNCLASSIFIED REPORT

DESCRIPTIONS: (•HUMAN ENGINEERING,  
•BIBLIOGRAPHIES), ABSTRACTS, INDEXES, TRAINING  
DEVICES, NAVAL TRAINING, ELECTRONIC EQUIPMENT,  
PHOTOGRAPHIC TECHNIQUES, PERFORMANCE(HUMAN),  
SENSORY PERCEPTION, SONAR, PSYCHOMETRICS,  
DISPLAY SYSTEMS, RADAR EQUIPMENT, MAN-MACHINE  
SYSTEMS, CONTROL SYSTEMS, SUBMARINES,  
COMMUNICATION SYSTEMS, NAVAL AVIATION  
IDENTIFIERS: ANNUTATED BIBLIOGRAPHIES, RATING  
SYSTEMS (U)

A COMPLETE BIBLIOGRAPHIC REFERENCE AND AN ABSTRACT  
ARE GIVEN FOR EACH OF THE 765 PUBLICATIONS OF THE  
HUMAN FACTORS LABORATORY FROM 1945 THROUGH  
1968. THE CITATIONS ARE ARRANGED CHRONOLOGICALLY  
AND ARE FOLLOWED BY THREE INDEXES: INDEX BY SOURCE  
(CONTRACTOR OR IN-HOUSE), AUTHOR INDEX, AND  
SUBJECT MATTER INDEX. THE LATTER CONSISTS OF ABOUT  
500 TOPICS. EACH OF THE 765 REPORTS HAS AT LEAST  
FOUR OF THESE SUBJECT MATTER REFERENCES; MOST REPORTS  
HAVE TWO OR THREE TIMES THIS MANY. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AU-668 180 5/10 13/10  
CALIFORNIA UNIV LOS ANGELES BIOTECHNOLOGY LAB

UNDERWATER WORK MEASUREMENT TECHNIQUES: 1968  
STUDIES. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
APR 69 64P HELTMAN, GERSHON; CHRISTIANSON,  
RAYMOND A.; EGSTRUM, GLEN M.; CROOKS, THOMAS  
P.;  
REPT. NO. 69-19, TN-46  
CONTRACT: N00014-67-A-0111  
PROJ: NR-196-069

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO INITIAL STUDIES DATED MAR  
68, AU-668 180.

DESCRIPTORS: (-PERFORMANCE(HUMAN)),  
UNDERWATER, (-DIVING, PERFORMANCE(HUMAN)),  
ENVIRONMENT, SEA WATER, BIOMETRY, SHALLOW WATER,  
SIMULATION, STRESS(PSYCHOLOGY), RESPIRATION,  
MONITORS, TEST METHODS, INSTRUMENTATION,  
RECORDING SYSTEMS, UNDERWATER VEHICLES, DEEP  
SUBMERGENCE, TABLES (U)

IDENTIFIERS: UNDERWATER WORK MEASUREMENT, SEALAB 3  
MANAGED SUBMERSIBLE (U)

THE REPORT REVIEWS PROGRESS FOR THE PERIOD  
FEBRUARY 1, 1968 TO JANUARY 31, 1969 IN THE STUDY  
OF UNDERWATER WORK MEASUREMENT TECHNIQUES BEING  
CONDUCTED AT THE UNIVERSITY OF CALIFORNIA, LOS  
ANGELES. RESEARCH EFFORTS CONCENTRATED ON A  
STUDY OF THE EFFECTS OF OCEAN ENVIRONMENT AND  
EXPERIENCE ON UNDERWATER WORK PERFORMANCE, AND ON  
PERFORMANCE MEASUREMENT DURING SEALAB III SHALLOW  
WATER TRIALS OF THE SALVAGE AND CONSTRUCTION TASKS.  
ADVANCES WERE ALSO MADE IN THE EQUIPMENT USED FOR  
UNDERWATER WORK MEASUREMENT. (AUTHOR) (U)

UNCLASSIFIED

UDL REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-69U 428 13/10  
ARCTIC INST OF NORTH AMERICA WASHINGTON D C

A SMALL RESEARCH SUBMARINE IN THE ARCTIC.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
64 OP MILNE, A. R.;

CONTRACT: N0NR-3496(U)

PROJ: NH-3U7-105

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN ARCTIC JNL. OF THE  
ARCTIC INSTITUTE OF NORTH AMERICA, V22 N1 P69-7U

MAR 69.

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH DEFENCE  
RESEARCH BOARD, OTTAWA (ONTARIO).

DESCRIPTIONS: (OCEANOLOGY; ARCTIC OCEAN);  
(UNDERWATER VEHICLES);

PERFORMANCE(ENGINEERING)), SEA ICE, DIVING,

UNDERWATER SOUND, CANADA

(U)

IDENTIFIERS: PISCES I VESSEL, MANNED  
SUBMERSIBLES

(U)

REPORTS ON THE TWO-MAN UNDERSEA WORK BOAT PISCES  
I WHICH MADE A TOTAL OF 15 DIVES DURING A SIX-WEEK  
JOINT SCIENTIFIC ENTERPRISE IN THE CANADIAN  
ARCTIC ARCHIPELAGO IN 1966.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-690 428 13/10  
ARCTIC INST OF NORTH AMERICA WASHINGTON D C

A SMALL RESEARCH SUBMARINE IN THE ARCTIC. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
by SP MILNE, A. R.;  
CONTRACT: N0NR-3996(U))  
PROJ: NR-307-105

UNCLASSIFIED REPORT  
AVAILABILITY: PUB. IN ARCTIC, JNL. OF THE  
ARCTIC INSTITUTE OF NORTH AMERICA, V22 N1 P69-70  
MAR 69.  
SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH DEFENCE  
RESEARCH BOARD, OTTAWA (ONTARIO).

DESCRIPTIONS: (OCEANOLOGY, ARCTIC OCEAN),  
(UNDERWATER VEHICLES,  
PERFORMANCE(ENGINEERING)), SEA ICE, DIVING,  
UNDERWATER SOUND, CANADA  
IDENTIFIERS: PISCES I VESSEL, MANNED  
SUBMERSIBLES (U)

REPORTS ON THE TWO-MAN UNDERSEA WORK BOAT PISCES  
I WHICH MADE A TOTAL OF 15 DIVES DURING A SIX-WEEK  
JOINT SCIENTIFIC ENTERPRISE IN THE CANADIAN  
ARCTIC ARCHIPELAGO IN 1968. (U)

96

UNCLASSIFIED

/ZHK23

UNCLASSIFIED

DUKE REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AU7092 423 6/11 6/17  
NAVY EXPERIMENTAL DIVING UNIT WASHINGTON D C

DIVER EQUIPMENT TESTS PERFORMED DURING THE JOINT U.  
S. NAVY/DUKE UNIVERSITY 1000 FOOT SATURATION  
DIVE. (U)

DESCRIPTIVE NOTE: FINAL REPT.  
APR 64 BSP HANTER, JOHN V.  
REPT. NO. NEDU-RN-2-69

UNCLASSIFIED REPORT  
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE.

DESCRIPTIONS: (UNDERWATER CLOTHING, BREATHING  
APPARATUS), (LIVING, LIFE SUPPORT),  
PERFORMANCE(HUMAN), THERMAL INSULATION, TEST  
METHODS, RESPIRATION, DESIGN (U)

A SERIES OF DIVING EQUIPMENT TESTS WERE PERFORMED  
AT DEPTHS OF 1000 AND 850 FEET DURING THE JOINT  
DUKE UNIVERSITY/NAVY 1000' FLEET SATURATION DIVE  
AT DUNHAM, NORTH CAROLINA. DESCRIPTION OF  
TESTS PERFORMED AND RESULTS THEREOF ARE PRESENTED FOR  
DOCUMENTATION PURPOSES. RECOMMENDATIONS FOR  
MODIFICATIONS AND FURTHER TESTING ARE PRESENTED.  
(AUTHOR) (U)

UNCLASSIFIED

UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NU. /ZHK23

AU-692 424 6/11 6/19  
NAVY EXPERIMENTAL DIVING UNIT WASHINGTON D C

JOINT U. S. NAVY-DUKE UNIVERSITY FOUR  
SATURATION DIVE.

(U)

DESCRIPTIVE NOTE: FINAL REPORT,  
APR 64 SJP SUMMITT; JAMES K. KELLEY,  
JAMES S. HERKON, JERRY M. SALTMAN, HERBERT  
A.;  
REPT. NU. NEDU-RH-3-69

UNCLASSIFIED REPORT

DESCRIPTIONS: (•LIFE SUPPORT, UNDERWATER VEHICLES),  
(•DIVING, STRESS(PHYSIOLOGY)),  
PERFORMANCE(HUMAN), OXYGEN, CARBON DIOXIDE,  
DIVING, DEEP SUBMERGENCE, EAR, BAROMETRIC  
PRESSURE, CLOSED ECOLOGICAL SYSTEMS  
IDENTIFIERS: HYPERBARIC MEDICINE (U)

FIVE EXPERIMENTAL SUBJECTS WERE EXPOSED TO A  
SIMULATED DEPTH OF 1000 FEET OF SEAWATER IN THE  
DUKE UNIVERSITY HYPERBARIC CHAMBER COMPLEX. THE  
COMPRESSION PHASE WAS COMPLETED OVER A 24 HOUR AND 22  
MINUTE PERIOD, AN AVERAGE DESCENT RATE OF 1.5 MINUTES  
PER FOOT. THE SUBJECTS REMAINED AT THE 1000 FOOT  
DEPTH FOR 77 HOURS AND 30 MINUTES. THIS WAS  
FOLLOWED BY 284 HOURS OF DECOMPRESSION, A RATE OF  
APPROXIMATELY 15 MINUTES PER FOOT WITH FOUR HOUR  
STOPS AT TEN STAGING DEPTHS. AN EXTENSIVE SERIES OF  
BIOMECHANICAL, DIVING EQUIPMENT AND HUMAN PERFORMANCE  
TESTS WERE CONDUCTED DURING EACH PHASE OF THE DIVE  
SEQUENCE. OXYGEN AND CARBON DIOXIDE LEVELS WERE  
VERY ACCURATELY CONTROLLED WITHIN SAFE LIMITS, THOUGH  
THE OXYGEN WAS MANIPULATED PERIODICALLY TO MEET THE  
REQUIREMENTS OF SPECIFIC BIOMEDICAL EXPERIMENTS.  
THESE OBSERVATIONS INDICATE THAT DIVERS CAN PERFORM  
WELL UNDER THESE CONDITIONS IF LIFE SUPPORT SYSTEMS  
MAINTAIN A LEVEL OF SUPPORT EQUIVALENT TO THAT AT THE  
SURFACE. (AUTHOR) (U)

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DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-695 377 6/14  
NAVY MEDICAL NEUROPSYCHIATRIC RESEARCH UNIT SAN DIEGO  
CALIF

SLEEP REQUIREMENTS OF MAN-IN-THE-SEA. (U)

AUG 69 44P NAUTUR PAUL ; TOWNSEND, R. F.  
GREENWOOD, M. ;  
REPT. NO. NMNRR-08-24  
PROJ. N4300-U3-ZU21D

UNCLASSIFIED REPORT

DESCRIPTIONS: (•SLEEP, •DIVING), SUBMARINES,  
PERFORMANCE(HUMAN), BEHAVIOR,  
FATIGUE(PHYSIOLOGY), ADAPTATION(PHYSIOLOGY),  
NITROGEN, CONTROLLED ATMOSPHERES, CONFINED  
ENVIRONMENTS (U)  
IDENTIFIERS, AQUANAUTS, TEXTITE I (U)

DESPITE RECENT SCIENTIFIC AND TECHNOLOGICAL GAINS  
IN REALIZING THE GOAL OF MANNED UNDERWATER STATIONS,  
THERE HAS BEEN A SINGULAR LACK OF RESEARCH DATA ON  
DEFINING THE SLEEP REQUIREMENTS OF MAN-IN-THE-SEA.  
BEHAVIORALLY, SLEEP LOSS AND SLEEP DISTURBANCES  
PRODUCE LAPSES IN PERFORMANCE AND IMPAIRMENT OF  
SHORT-TERM MEMORY, NEITHER OF WHICH MAY ENDANGER THE  
MISSION OR THE LIFE OF THE ENTIRE CREW OF AN OCEAN  
FLOOR HABITAT. INTERPERSONAL DIFFICULTIES MAY ALSO  
ARISE AS A RESULT OF UNDESIRABLE PERSONALITY CHANGES  
CAUSED BY SLEEP DISTURBANCES, THEREBY WEAKENING THE  
VERY ROOT OF THE MINIATURE SOCIETY OF THE OCEAN FLOOR  
HABITAT. RESEARCH EFFORTS MUST BE SPURRED ON TO  
LEARN: (1) WHETHER MAN AS AN AQUANAUT MAY  
DEVELOP NEW KINDS OF SLEEP REQUIREMENTS WHICH DIFFER  
FROM THOSE OF LAND BASED MAN, (2) WHETHER MAN MAY  
ALSO DEVELOP SERIOUS SLEEP DISTURBANCES, WHETHER WE  
CAN SPECIFY THE OPTIMAL PHYSICAL AND PSYCHOLOGICAL  
CONDITIONS FOR MAN'S RECOVERY FROM FATIGUE BY  
ADEQUATE SLEEP IN THE UNDERWATER HABITAT. TEXTITE  
I, A NITROGEN SATURATION DIVING EXPERIMENT IS USED  
TO ILLUSTRATE AN ATTEMPT TO OBTAIN THE DATA NECESSARY  
TO DEFINE SLEEP REQUIREMENTS OF MAN-IN-THE-SEA.  
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CNTRL NO. /ZMK23

AU-695 034 5/10 4/2  
APPLIED PSYCHOLOGICAL SERVICES INC WAYNE PA SCIENCE  
CENTER

DIGITAL SIMULATION OF THE PERFORMANCE OF  
INTERMEDIATE SIZE CREWS. I. LOGIC OF A MODEL  
FOR SIMULATING CREW PSYCHOSOCIAL AND PERFORMANCE  
VARIABLES. (U)

SEP 64 101P SIEGEL, ARTHUR I.; WOLF, J.  
JAY FISCHL, M. A. I.  
CONTRACT. NUUUI4-60-C-0262  
PROJ. NM-170-710

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UNCLASSIFIED REPORT

DESCRIPTION: (MAN-MACHINE SYSTEMS, MATHEMATICAL  
MODELS), (GROUP DYNAMICS, SIMULATION), NAVAL  
RESEARCH, PSYCHOMETRICS, SOCIO METRICS,  
PERFORMANCE(HUMAN), MILITARY PSYCHOLOGY,  
DIGITAL COMPUTERS, LOGIC CIRCUITS,  
STRESS(PSYCHOLOGY), FATIGUE(PHYSIOLOGY),  
ENERGY, EFFICIENCY, NAVAL PERSONNEL (U)

SELECTED PSYCHOSOCIAL, PERSONNEL, AND PERFORMANCE  
VARIABLES ARE IDENTIFIED AND DISCUSSED AS THEY APPLY  
TO THE SITUATION OF CREWS OF MODERATE SIZE. BASED  
ON CURRENT PSYCHOLOGICAL THEORY, MILITARY DOCTRINE,  
AND PREVIOUSLY DEVELOPED AND TESTED FUNCTIONAL  
RELATIONSHIPS, THESE VARIABLES ARE WOVEN INTO A  
STOCHASTIC MATHEMATICAL MODEL FOR DIGITALLY  
SIMULATING CLOSED MAN-MACHINE SYSTEMS OPERATED BY  
CREWS OF FROM 4 TO 20 MEMBERS. THE PROBABILISTIC  
MODEL IS PRESENTED IN TERMS OF A DETAILED LOGIC AND  
PROCESSING FLOW SEQUENCE WITH PRESCRIBED INPUT DATA.  
RESULTS FROM THE MODEL, AS CALLED FOR BY THE  
LOGIC, INCLUDE MEASURES OF PERSONNEL LOADING, CREW  
SAFETY, AND CREW PERFORMANCE ADEQUACY. (U)

(AUTHOR)

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/ZMK23

UNCLASSIFIED

VUL REPORT BIBLIOGRAPHY SEARCH CUNTRUL NO. /ZHK23

AUG 69 24 8/16  
NAVAL HOSPITAL GREAT LAKES ILL MEDICAL SERVICE

MAN'S PERFORMANCE IN THE SEA SEMINAR. (U)

DESCRIPTIVE NOTE: PROGRESS REPT.,  
SER BY I&P MOLLIEH, MARSH BRANDT, JOHN S  
DLN, UUHALD ;  
REPT. NO. CSL/JMK-26  
CONTRACT: N0001-50012U)

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPORT ON UNDERWATER SPEECH  
COMMUNICATION.

DESCRIPTIONS: (OCEANOLOGY, SYMPOSIA),  
(UNDERWATER COMMUNICATION SYSTEMS, SPEECH  
RECOGNITION), SCUBA DIVING,  
PERFORMANCE(HUMAN), VOICE COMMUNICATION SYSTEMS,  
DIVING, MAN-MACHINE SYSTEMS (U)

A SEMINAR WAS CONDUCTED IN ORDER TO INFORM AND  
STIMULATE YOUNG WORKERS OF HIGH RESEARCH POTENTIAL  
WITH RESPECT TO APPROPRIATE RESEARCH CONCEPTS, DESIGN  
AND METHODOLOGY - AND CURRENT OCEANOGRAPHIC PROJECTS.  
THE FOCUS OF THE SEMINAR WAS ON MAN'S PERFORMANCE  
IN THE SEA AND IT WAS DEVELOPED WITH RESPECT TO FIVE  
MAJOR AREAS OF UNDERWATER RESEARCH: PERCEPTION,  
PHYSIOLOGY, HUMAN PERFORMANCE, COMMUNICATION AND  
HABITATS. THE DOCUMENT IS COMPRISED OF A LIST OF  
PARTICIPANTS AND THE SEMINAR SCHEDULE. (AUTHOR) (U)

UNCLASSIFIED

DDL REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AU-09/ 737 6/17  
NORTH AMERICAN ROCKWELL CORP Downey Calif Space Div

A STUDY OF WORK-PRODUCING CHARACTERISTICS OF  
UNDERWATER OPERATIONS AS A FUNCTION OF DEPTH. (U)

DESCRIPTIVE NOTE: FINAL REPT. MAY-NOV 69,  
NOV 69 48P STREIMER, I. ;  
REPT. NO. SU-09-12  
CONTRACT: N00014-61-C-0363  
PROJ: NR-146-U70

UNCLASSIFIED REPORT

Reproduced from  
best available copy.

DESCRIPTIONS: (EXERCISE, BAROMETRIC PRESSURE),  
(DIVING, EXERCISE), METABOLISM,  
PERFORMANCE(HUMAN), BODY TEMPERATURE, HEART,  
SKIN, RESPIRATION, OXYGEN CONSUMPTION,  
STATISTICAL ANALYSIS, MEASUREMENT (U)  
IDENTIFIERS: ERGOMETRICS (U)

THE EFFECTS OF ALTERATIONS IN WORKING DEPTH UPON  
THE WORK-PRODUCING CHARACTERISTICS OF HUMAN  
PERFORMING SPECIFIC UNDERWATER MANUAL TASKS WERE  
EXAMINED. THE TASKS WERE: (1) A SIMPLE,  
REPETITIVE ROTARY TASK REQUIRING CONTINUOUS TORQUE  
PRODUCTION AGAINST A FIXED RESISTANCE IN A SELF-PACED  
MANNER; AND (2) A SIMPLE, REPETITIVE,  
DISCONTINUOUS FLEXION/EXTENSION TASK REQUIRING THE  
EXERTION OF LINEAR FORCES AGAINST A FIXED RESISTANCE  
IN A SELF-PACED MANNER. THE WORK WAS PERFORMED AT  
TWO DEPTHS, 33 AND 66 FEET IN THE OPEN OCEAN.  
DURING WORK SESSIONS, HEART RATE AND THREE SKIN  
TEMPERATURES WERE RECORDED. SIMILARLY, TECHNIQUES  
WERE EMPLOYED WHICH ALLOWS MEASUREMENT OF MEAN  
RESPIRATORY FLOW VOLUMES AND OXYGEN UPTAKE LEVEL.  
THE RESULTS OBTAINED WERE EXAMINED AS FUNCTIONS OF  
TASK AND DEPTH. STATISTICALLY SIGNIFICANT  
PERFORMANCE DIFFERENCES WERE FOUND AND RELATED TO  
PREVIOUS STUDY RESULTS. (AUTHOR) (U)

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DUC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AUD697 934 5/8  
NORTH AMERICAN ROCKWELL CORP COLUMBUS OHIO COLUMBUS  
DIV

SYMPONIUM ON APPLIED MODELS OF MAN-MACHINE SYSTEMS  
PERFORMANCE, COLUMBUS, OHIO, 12-14 NOVEMBER  
1968.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,  
NOV 64 340P LEVY, GERALD NO. 1  
REPT. NO. NR69M-591  
CONTRACT: ADUU14-68-L-U418  
PROJ: NR-196-083

UNCLASSIFIED REPORT

DESCRIPTORS: (MAN-MACHINE SYSTEMS, \*SYMPOSIA),  
PERFORMANCE(ENGINEERING), MATHEMATICAL MODELS,  
HUMAN ENGINEERING, CYBERNETICS,  
PERFORMANCE(HUMAN), TARGET ACQUISITION, VISUAL  
PERCEPTION, SONAR PERSONNEL, DETECTION,  
SIMULATION, RELIABILITY, IDENTIFICATION  
IDENTIFIERS. COMPUTERIZED SIMULATION

(U)

(U)

CONTENTS: THE RULE OF APPLIED MAN-MACHINE  
MODELS; THE DEVELOPMENT OF SOPHISTICATED MODELS OF  
MAN-MACHINE SYSTEM PERFORMANCE; CRITERIA FOR  
SELECTION AND APPLICATION OF MODELS; A VISUAL  
TARGET ACQUISITION MODEL; UNFINISHED BUSINESS IN  
THE UTILITY OF VISUAL DETECTION MODELS; MODELING  
THE SONAR OPERATOR'S DETECTION PROCESS--A PROGRESS  
REPORT; FIELD EVALUATION OF A VISUAL DETECTION  
MODEL; HUMAN OPERATOR MODELS FOR MANUAL CONTROL;  
EXPOSITION OF A HUMAN CONTROL MODEL AND ITS  
APPLICATION; COMPUTER SIMULATION--SAVION,  
SANCTUARY, OR SILLNESS; ASSUMPTIONS UNDERLYING THE  
HUMAN RELIABILITY MODEL; APPLICATION OF A MULTIPLE  
TASK INTERACTIVE MODEL--SIMULATION OF HUMAN  
PERFORMANCE IN SONAR MAINTENANCE.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-690 310 S/10  
GENERAL DYNAMICS CORP GROTON CONN ELECTRIC BOAT DIV

DIVER PERFORMANCE MEASUREMENT: TRANSPORTING  
NEUTRALLY BUOYANT OBJECTS MANUAL MOVEMENT OF HEAVY  
OBJECTS. (U)

DESCRIPTIVE NOTE: FINAL REPT. 1 APR 68-31 MAR 69.  
JUL 69 44P ANDERSEN,B. G. ALLEN,F.

L. FLANAGAN, C. J.

REPT. NO. U417-69-U68

CONTRACT: N00014-67-L-0447

PROJ: NR-146-U68

UNCLASSIFIED REPORT

Reproduced from  
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DESCRIPTORS: (\*PERFORMANCE(HUMAN)), \*SWIMMING),  
MEASUREMENT, FATIGUE(PHYSIOLOGY), ENDURANCE,  
DIVING, WEIGHT, DRAG, VELOCITY, MOBILITY (U)

THE REPORT PRESENTS THE RESULTS OF THE SECOND PHASE  
IN A PROGRAM OF DIVER PERFORMANCE MEASUREMENT. THE  
PURPOSE OF THE PROGRAM WAS TO DEVELOP AND APPLY  
MEASUREMENT TECHNIQUES TO DETERMINE A FREE-SWIMMING  
DIVER'S CAPACITY TO TRANSPORT OBJECTS OF VARYING SIZE  
AND WEIGHT UNDERWATER. TWO EXPERIMENTS WERE  
CONDUCTED DURING THIS PHASE OF THE PROGRAM. THE  
FIRST WAS TO MEASURE A DIVER'S ABILITY TO SWIM WITH  
NEUTRALLY BUOYANT OBJECTS OF VARYING SIZE TO  
DETERMINE THE EFFECTS OF INCREASED DRAG ON A SWIMMER.  
THE SECOND EXPERIMENT CONSISTED OF AN EXPLORATORY  
INVESTIGATION OF A DIVER'S ABILITY TO MOVE HEAVY  
OBJECTS UNDERWATER FOR SHORT DISTANCES.

(AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-694 17U 6/11 15/5  
NAVY EXPERIMENTAL DIVING UNIT WASHINGTON D C

AD HUC COMMITTEE REPORT.

(U)

DESCRIPTIVE NOTE: RESEARCH REPT. 7-25 JAN 68,  
66 7SP MUNDUCH, RICHARD A.; BEAGLES,  
JOHN A.; SELKINS, JAMES H.; FLURAN, MICHAEL J.  
JENKINS, WALLACE T.;  
REPT. NO. NEDU-RH-3-68

UNCLASSIFIED REPORT

DESCRIPTORS: (UNDERWATER CLOTHING, MILITARY  
REQUIREMENTS), (DIVING, LIFE SUPPORT),  
LOGISTICS, HELMETS, BREATHING APPARATUS, GAS  
FLOW, COMMUNICATION SYSTEMS, LOGISTICS,  
DECOMPRESSION SICKNESS

(U)

THE OBJECT OF THE STUDY WAS TO SURVEY THE FIELD OF  
DIVING EQUIPMENTS, CATALOGUE DEFICIENCIES OF EXISTING  
EQUIPMENTS, ENUMERATE EQUIPMENTS NOT NOW AVAILABLE  
WHICH SHOULD BE DEVELOPED AND TO RECOMMEND SHORT AND  
LONG RANGE DEVELOPMENT PROGRAMS. A SUMMARY OF COST  
BY EQUIPMENT IS INCLUDED. (AUTHOR)

(U)

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/ZHK23

UNCLASSIFIED

UDC REPORT BIBLIOGRAPHY SEARCH CNTRL NU. /ZHK23

AUT702 UDU 8/16 14/2 6/11  
OFFICE OF NAVAL RESEARCH WASHINGTON D C

SUMMARY REPORT ON PROJECT TEKTITE I. A  
MULTIAGENCY 60-DAY SATURATED DIVE CONDUCTED BY THE  
UNITED STATES NAVY, THE NATIONAL AERONAUTICS AND  
SPACE ADMINISTRATION, THE DEPARTMENT OF THE  
INTERIOR, AND THE GENERAL ELECTRIC COMPANY, (U)

JAN 70 59P PAUL L.D. COLE, H. A.  
REPT. NU. UNR-DR-153-S

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UNCLASSIFIED REPORT

DESCRIPTORS: (\*OCEAN BOTTOM, LABORATORIES),  
(\*CONTINENTAL SHELVES, EXPLORATION), (\*LIFE  
SUPPORT, OCEAN BOTTOM), DIVING, CLOSED  
ECOLOGICAL SYSTEMS, UNDERWATER, VENTILATION,  
COMMUNICATION SYSTEMS, UNDERWATER CLOTHING,  
SAFETY, DESIGN, MARINE ENGINEERING, MARINE  
BIOLOGY, MARINE GEOLOGY, ADJUSTMENT(PSYCHOLOGY),  
VIRGIN ISLANDS  
IDENTIFIERS. \*TEKTITE I PROGRAM (U)

AN OCEAN FLOOR HABITAT AT A 49 FOOT DEPTH AND THE  
SUPPORTING FACILITIES WERE ESTABLISHED AND EVALUATED  
FOR 60 DAYS AT A CAREFULLY SELECTED, ISOLATED SITE IN  
THE VIRGIN ISLANDS FROM FEBRUARY 15 TO APRIL  
15, 1969. FOUR MARINE SCIENTISTS LIVED IN AND  
WORKED OUT OF THE HABITAT FOR THE 60-DAY PERIOD,  
DURING WHICH THEIR RESEARCH EMPHASIZED MARINE BIOLOGY  
AND GEOLOGY. THIS WAS TWICE AS LONG AS MEN HAD  
PREVIOUSLY LIVED UNDER SATURATED DIVING CONDITIONS  
AND THE ONLY SUCH EXPERIMENT TO USE A CONTROLLED  
NITROGEN/OXYGEN ATMOSPHERE WITH A NORMAL 0.2-  
ATMOSPHERE OXYGEN PARTIAL PRESSURE. THROUGH  
CONTINUAL TELEVISION AND AUDITORY MONITORING, MEDICAL  
DOCTORS, PSYCHOLOGISTS, AND DIVING ENGINEERS STUDIED  
THE ASTRONAUTS' BIOMEDICAL RESPONSES TO THE 60-DAY  
SATURATION DIVE AND THEIR BEHAVIORAL AND OTHER  
PSYCHOLOGICAL RESPONSES TO EACH OTHER, TO THEIR WORK,  
AND TO THEIR ISOLATED, HOSTILE ENVIRONMENT.  
(AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-7UZ 181 6/14 6/14  
BIO TECHNOLOGY INC FALLS CHURCH VA

HUMAN PERFORMANCE IN THE UNDERSEA ENVIRONMENT: AN  
ANNOTATED BIBLIOGRAPHY. (U)

JAN 7L 9UP REILLY, RAYMOND E.  
CONTRACT: N00014-7U-L-0052

UNCLASSIFIED REPORT

DESCRIPTIONS: (DEEP SUBMERGENCE, BIBLIOGRAPHIES),  
(PERFORMANCE(HUMAN), UNDERWATER, LIFE  
SUPPORT, ABSTRACTS, UNDERWATER COMMUNICATION  
SYSTEMS, HEARING, HUMAN ENGINEERING, UNDERWATER  
NAVIGATION, DIVING, DECOMPRESSION SICKNESS,  
PERCEPTION(PSYCHOLOGY), VISION, PERSONALITY,  
SCUBA DIVERS, UNDERWATER VEHICLES (U)

THE REPORT IS AN ANNOTATED BIBLIOGRAPHY OF 149  
REFERENCES CONCERNING HUMAN PERFORMANCE AND  
PHYSIOLOGY IN THE UNDERSEA AND DRY HYPERBARIC  
ENVIRONMENT. ALSO INCLUDED ARE LISTS OF ADDITIONAL  
BIBLIOGRAPHIES AND SCIENTISTS ENGAGED IN UNDERSEA  
RESEARCH. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AD9703 610 6/14  
NAVY EXPERIMENTAL DIVING UNIT WASHINGTON D C

REPETITIVE EXCURSION DIVES FROM SATURATED DEPTHS ON  
HELUM-OXYGEN MIXTURES. PHASE I: SATURATION  
DEPTH 350 FEET. (U)

DESCRIPTIVE NOTE: RESEARCH REPT.,  
MAN 7U SSP SUMMITT JAMES K. HERRON,  
JERRY M. FLYNN, EDWARD T. I.  
REPT. NO. NEDU-RK-2-70

UNCLASSIFIED REPORT  
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE.

Reproduced from  
best available copy.

DESCRIPTIONS: \*DEEP SUBMERGENCE DIVING,  
\*DIVING, STANDARDS, \*DECOMPRESSION SICKNESS,  
DIVING, PERFORMANCE(HUMAN), HELIUM GROUP  
GASES, TISSUES(BIOLOGY), HEARING,  
JOINTS(PHYSIOLOGY), HELIUM, TEST FACILITIES  
IDENTIFIERS: \*DEEP DIVING REPETITIVE EXCURSION  
TABLES, \*SATURATION DIVING, \*EXCURSION DIVING (U)

FIVE SSU FOUT SATURATION DIVES WERE CONDUCTED AT  
THE NAVY EXPERIMENTAL DIVING UNIT TO VERIFY A  
NO-DECOMPRESSION, REPETITIVE EXCURSION FORMAT  
DEVELOPED BY DSSP (PM-11). TWENTY DIVERS  
COMPLETED A TOTAL OF 344 MAN-EXCURSION DIVES FROM THE  
SATURATION DEPTH. NO SYMPTOMS OF DECOMPRESSION  
SICKNESS WERE REPORTED DURING THE EXCURSION DIVES,  
DURING THE BOTTOM TIME AT 350 FEET OR DURING THE  
FIRST 200 FEET OF DECOMPRESSION BACK TO THE SURFACE.  
FIVE CASES OF DECOMPRESSION SICKNESS DID OCCUR  
DURING THE LATTER STAGES OF DECOMPRESSION AND THEY  
ARE DISCUSSED BRIEFLY. THE OCCURRANCE OF  
COMPRESSION ARTHRALGIA AND EXTERNAL OTITIS ON DEEP  
SATURATION-EXCURSION DIVES IS ALSO DISCUSSED.  
(AUTHOR) (U)

UNCLASSIFIED

DUL REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-700 624 S/9  
NAVAL SUBMARINE MEDICAL CENTER GROTON CONN SUBMARINE  
MEDICAL RESEARCH LAB

CHARACTERISTICS OF THE SUBMARINE LINE OFFICER I.  
A FACTOR ANALYTICAL STUDY OF THE OFFICER CANDIDATE  
FOR THE SUBMARINE SERVICE. (U)

DESCRIPTIVE NOTE: INTERIM REPT.,  
MAN 7U 17P NEYARES, BENJAMIN B.;  
REPT. NO. SMRL-616  
PHOU: MF12-524-0U2-9U04  
TASK: MF12-524-0U2-9U0405

UNCLASSIFIED REPORT

DESCRIPTIONS: (•OFFICER PERSONNEL, •SUBMARINE  
PERSONNEL), FACTOR ANALYSIS,  
PERFORMANCE(HUMAN), SELECTION,  
PERSONALITY (U)

THE GOALS OF THE STUDY WERE TWO-FOLD: (1) TO  
IDENTIFY THE TRAIT CONFIGURATIONS CHARACTERIZING THE  
DIFFERENT TYPES OF OFFICERS WHO VOLUNTEER FOR THE  
SUBMARINE SERVICE; AND (2) TO INVESTIGATE  
DIFFERENCES IN PERFORMANCE OF THE OFFICERS MAKING UP  
EACH GROUP IDENTIFIED IN THIS MANNER. THIRTY-FIVE  
ITEMS OF DATA, INCLUDING APTITUDE AND PERSONALITY  
TESTS, SECTION LEADER RATINGS AND GRADES IN  
SUBMARINE SCHOOL WERE OBTAINED FROM A SAMPLE OF  
150 OFFICERS. A CENTROID FACTOR ANALYSIS DELINEATED  
FIVE FACTORS, LABELED: F1 - TRAIT  
CONFIGURATION OF AN IDEAL SUBMARINE OFFICER  
CANDIDATE; F2 - GENERAL TEMPERAMENT  
DIMENSION; F3 - SPECIAL APTITUDES; F4 -  
POLITICO-ECONOMIC INTERESTS, AND F5 -  
FOCUSED THEORETICAL INTERESTS. ONLY THOSE  
OFFICERS WHO OBTAIN HIGH SCORES IN F1 AND F3  
RECEIVE COMPARABLY HIGH GRADES IN BASIC SUBMARINE  
SCHOOL. A DETAILED DISCUSSION OF THE STRUCTURE  
OF EACH FACTOR IS PRESENTED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-700 68U 6/17 13/1  
NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF

SEALAB III - DIVER'S ISOTOPIC SWIMSUIT-HEATER  
SYSTEM. (U)

DESCRIPTIVE NOTE: TECHNICAL NOTE,  
MAY 70 120P BAYLES, JOHN JO; TAYLOR,  
DOUGLAS;  
REPT. NO. NCCL-TN-1087  
PHQJ: NCCL-A7-005 Reproduced from  
best available copy.

UNCLASSIFIED REPORT

DESCRIPTIONS: \*UNDERWATER CLOTHING, \*HEATING ELEMENTS, DIVING, PLUTONIUM, RADIOACTIVE ISOTOPES, PLASTICS, PIPES, PUMPS, HYDROSTATIC PRESSURE, PROTECTION, ENVIRONMENTAL TESTS, RELIABILITY, SPECIFICATIONS (U)

IDENTIFIERS: \*SEALAB 3, BACKPACKS, \*RADIOISOTOPE HEAT SOURCES (U)

THE ATOMIC ENERGY COMMISSION AND THE DEEP SUBMERGENCE SYSTEMS PROJECT OFFICE INCLUDED THE DEVELOPMENT AND EVALUATION OF AN ISOTOPIC SWIMSUIT HEATING SYSTEM IN THE SEALAB III PROGRAM TO DEMONSTRATE A USE OF ATOMIC ENERGY AS A METHOD FOR PROVIDING SUPPLEMENTAL HEAT TO DIVERS. THE TASK OF DEVELOPING A SWIMSUIT HEATING 'PACKAGE' WAS ASSIGNED TO THE NAVAL CIVIL ENGINEERING LABORATORY, PORT HUENEME, CALIFORNIA. THE 'PACKAGE' UTILIZES AEC FURNISHED PLUTONIUM 238 CAPSULES FOR HEATING WATER WHICH IS PUMPED THROUGH A CLOSED-CYCLE SYSTEM INCLUDING A DIVER'S UNDERGARMENT FITTED WITH CLOSELY SPACED PLASTIC TUBING. THE DIVER WEARS A WET SUIT OVER THIS UNDERGARMENT TO AID IN RETAINING THE HEAT PROVIDED. THE 'PACKAGE' OR ISOTOPE BACKPACK SEGMENT IS DESIGNED TO BE ATTACHED TO A MODIFIED MARK VIII MIXED GAS BREATHING APPARATUS BACKPACK. THE SPECIFICATIONS BASED UPON AVAILABLE INFORMATION AT THE TIME OF INITIAL DEVELOPMENT STAGES, DID NOT PROVIDE FOR SUFFICIENT ISOTOPE TO PRODUCE ADEQUATE SUPPLEMENTAL HEAT. HOWEVER, THE FINAL BACKPACK DESIGN DID NOT MATERIALLY AFFECT THE DIVER'S CAPABILITIES AND THE SYSTEM WAS SUCCESSFULLY TESTED WITH RESPECT TO ITS DESIGN OPERATIONAL CHARACTERISTICS. (AUTHOR) (U)

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/ZHK23

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AD-704 141 13/10 5/4  
NAVAL PERSONNEL RESEARCH AND DEVELOPMENT LAB WASHINGTON D  
C

PERSONNEL AND TRAINING REQUIREMENTS FOR THE ASR-21  
RESCUE CONTROL CENTER. (U)

DESCRIPTIVE NOTE: PRELIMINARY REPT. JAN-UCT 69,  
JUN 70 34P DELUCA, JOSEPH F., NOBLE,  
JUN 70 :  
REPT. NO. WRH-70-4

UNCLASSIFIED REPORT

DESCRIPTIONS: (UNDERWATER VEHICLES, SEA RESCUES),  
(NAVAL TRAINING, DEEP SUBMERGENCE), SUBMARINE  
ESCAPE, CATAMARANS, SONAR PERSONNEL, MAINTENANCE  
PERSONNEL, CONTROL SYSTEMS, TRACKING, COMPUTER  
PERSONNEL, DATA PROCESSING SYSTEMS, SONAR EQUIPMENT,  
PROGRAMMED INSTRUCTION, VIEWING SCREENS (U)  
IDENTIFIERS: ASR-21 VESSEL, DEEP SUBMERGENCE  
REScue VEHICLES (U)

THE REPORT CONCERNs ITSELF WITH THE IDENTIFICATION  
OF PERSONNEL AND TRAINING REQUIREMENTS FOR THE  
RESCUE CONTROL CENTER (RCC), ASR-21  
CLASS. INFORMATION IN THIS REPORT WILL BE  
UTILIZED IN ESTABLISHING INITIAL TRAINING COURSES AND  
THE INITIAL TRAINING SITE FOR ASR-21 AND ASR-22  
PERSONNEL. (AUTHOR) (U)

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UNCLASSIFIED

/ZMK23

UNCLASSIFIED

UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-704 393 15/10  
ASSOCIATION OF SENIOR ENGINEERS (NAVSHIPS) WASHINGTON D C

1970 ANNUAL TECHNICAL SYMPOSIUM (7TH).  
MECHANICAL SYSTEMS FOR OCEAN ENGINEERING, (U)

70 50P SOUTHERLAND, ARTHUR , JR;  
UNCLASSIFIED REPORT Reproduced from  
best available copy.

SUPPLEMENTARY NOTE: ERRATA SHEET INSERTED.

DESCRIPTORS: (UNDERWATER VEHICLES, RECOVERY),  
DEEP SUBMERGENCE, STABILIZED PLATFORMS, TEST  
EQUIPMENT, CONTROL SYSTEMS, UNDERWATER EQUIPMENT,  
PAYLOAD, CABLES(MECHANICAL), HANDLING,  
DIVING, CONFIGURATION, SEA RESCUE EQUIPMENT,  
RESCUES, SUBMARINES, HYDRAULIC SERVOMECHANISMS (U)  
IDENTIFIERS: ALVIN VESSEL (U)

THE PAPER DISCUSSES MECHANICAL HANDLING SYSTEMS  
DESIGN CONSIDERATIONS, PERFORMANCE REQUIREMENTS AND  
PROBLEM AREAS ASSOCIATED WITH SALVAGE AND RESCUE  
OPERATIONS INCLUDING HANDLING OF SUBMERSIBLE VEHICLES  
AND OTHER LARGE OBJECTS AT SEA. SHIP MOTION  
RESPONSE TO VARIOUS SEA CONDITIONS AND THE  
CAPABILITIES AND LIMITATIONS OF PRESENT HANDLING  
METHODS ARE EVALUATED. EMPHASIS IS PLACED ON THE  
EFFECT OF DYNAMIC LOADS IMPOSED ON THE HANDLING GEAR  
AND METHODS OF LOAD ATTENUATION AND MOTION  
COMPENSATION. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AU-767 423 13/10  
NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF

SALVAGE DURK PROJECTS-SEALAB III.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT. JAN 67-JUN 69,  
JUL 70 142P DAYLES, JOHN J.  
REPT. NO. NCLL-TR-084  
PHOU: NCLL-56-001

UNCLASSIFIED REPORT

DESCRIPTIONS: (MARINE ENGINEERING, SALVAGE),  
(SALVAGE, UNDERWATER VEHICLES), LIFT,  
BUOYANCY, FLUTTS, PNEUMATIC SYSTEMS, UNDERWATER  
LIGHTS, LOGISTICS, DIVING, HUMAN ENGINEERING

(U)

IDENTIFIERS: SEALAB 3 VESSEL, MANNED  
SUBMERSIBLES

(U)

THE SEALAB III PROGRAM, UNDER THE DIRECTION OF  
THE OCEAN ENGINEERING BRANCH, DEEP  
SUBMERGENCE SYSTEMS PROJECT OFFICE, WAS  
INITIATED TO ADVANCE THE STATE-OF-THE-ART OF MAN'S  
CAPABILITY TO LIVE AND WORK IN THE DEEP OCEAN  
ENVIRONMENT. IT IS THE GOAL OF THE SALVAGE  
PROJECTS FOR SEALAB III TO DEMONSTRATE AND FIELD  
TEST SOME OF THE MORE IMPRESSIVE NEW SALVAGE DEVICES  
AND TECHNIQUES. THIS REPORT DISCUSSES THE AQUANAUT  
FAMILIARIZATION AND TRAINING PHASES ASSOCIATED WITH  
THE SALVAGE PROJECTS PLANNED FOR TEAM TWO--  
SEALAB III, AND THE MODIFICATIONS TO BOTH  
EQUIPMENTS AND PROCEDURES AS SUGGESTED BY THE DIVERS.  
PRELIMINARY RESULTS ARE INCLUDED WITH  
RECOMMENDATIONS REGARDING FUTURE PLANS. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-71U 348 6/14  
CALIFORNIA UNIV LOS ANGELES SCHOOL OF ENGINEERING AND  
APPLIED SCIENCE

UNDERWATER WORK MEASUREMENT TECHNIQUES 1969  
STUDIES.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
JUL 70 SUP WELTMAN, GERSHON, EGSTROM,  
GLEN M.; CHUOKS, THOMAS P.; CHRISTIANSON,  
RAYMOND A. I  
REPT. NO. UCLA-ENG-7052  
CONTRACT: NOUUI4-69-A-0200-4025  
PROJ: NK-196-069

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SUPPLEMENTARY NOTE: ALSO AVAILABLE AS BIOTECHNOLOGY  
LAB. TECHNICAL REPT. NO. 48.

DESCRIPTIONS: (\*PERFORMANCE(HUMAN)),  
UNDERWATER), (\*PERCEPTION,  
STRESS(PSYCHOLOGY)), (\*DIVING,  
PERFORMANCE(HUMAN)), ERGOMETERS, PULSE RATE,  
RESPIRATION, OXYGEN, SWIMMING  
IDENTIFIERS: \*WORK MEASUREMENT, \*UNDERWATER  
PERFORMANCE, SEALAB 3

(U)

(U)

RESEARCH WORK FOCUSED ON QUESTIONS OF PERCEPTUAL  
NARRROWING DURING STRESS AND ON COMPLEX TASK  
PERFORMANCE OF EXPERIENCED DIVERS UNDER ADVERSE OCEAN  
CONDITIONS. WORK BEGAN ON COMPUTER HANDLING OF THE  
SEALAB III SCENARIO WAS COMPLETED, AND SEVERAL  
PUBLICATIONS PREPARED. (AUTHOR)

(U)

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UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AU-71J 147 6/14 5/10  
MAN FACTORS INC SAN DIEGO CALIF

EFFECTS OF THE UNDERWATER ENVIRONMENT UPON WORK  
EFFICIENCY OF DIVERS. (U)

DESCRIPTIVE NOTE: FINAL TECHNICAL REPT. MAR-AUG 70,  
UCT 7U 44P STREIMER, IRVING; TURNER, D.  
P. NO : VOLKMER, RENT; GUERIN, D.;  
REPT. NO. MFI-70-117  
CONTRACT: N00014-70-L-0169  
PROJ: NK-146-070

UNCLASSIFIED REPORT

DESCRIPTIONS: (•HUMAN REACTIONS, UNDERWATER),  
(•REASONING, UNDERWATER), (•LIVING,  
PERFORMANCE(HUMAN)), LEARNING CURVES, MEMORY,  
RESPIRATION, GASES, CONSUMPTION, PULSE RATE,  
CONFINED ENVIRONMENTS (U)

IDENTIFIERS: •UNDERWATER ERGONOMICS, HEART  
RATE (U)

THE EFFECTS OF WORKING UNDERWATER UPON CERTAIN  
HUMAN PERFORMANCE CHARACTERISTICS DURING THE  
EXECUTION OF SPECIFIC COMPLEX TASKS WERE STUDIED.  
THE TASKS EXAMINED HERE: A COMPLEX MAINTENANCE  
TASK INVOLVING THE DISASSEMBLY AND REASSEMBLY OF A  
WATER FILTRATION UNIT, AND THE EXECUTION OF A METAL  
TASK INVOLVING THE PROCESSES OF NUMERICAL REASONING,  
DIGIT MEMORY SPAN AND PATTERN PERCEPTION. THESE  
TASKS WERE PERFORMED IN SELF-PAUSED FASHION AT A  
WORKING DEPTH OF 33 FEET. DURING TEST SESSIONS  
MEASURES WERE TAKEN OF BREATHING GAS CONSUMPTION  
RATE, (LITERS/MIN. STPD, AIR), AS WELL AS TIME  
AND ACCURACY MEASURES OF THE TASK PERFORMED.  
(AU, HUM) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AU-713 395

6/11

BATTELLE MEMORIAL INST COLUMBUS OHIO COLUMBUS LABS

LOW-PRESSURE COMPRESSED AIR BREATHING SYSTEMS  
STUDY. II. MARK V HELMET VENTILATION STUDIES. (U)

DESCRIPTIVE NOTE: SUMMARY TECHNICAL REPT. 1 APR-1 AUG  
70.

SEP 70 54P HENKENER, JERRY A.  
CONTRACT: N00014-69-C-0352

UNCLASSIFIED REPORT

Reproduced from  
best available copy.

DESCRIPTIONS: (1)LOW-PRESSURE RESEARCH, (2)BREATHING APPARATUS, (3)HELMETS, DIVING), (4)DIVING, BREATHING APPARATUS), UNDERWATER CLOTHING, VENTILATION, CARBON DIOXIDE, EFFECTIVENESS, RESPIRATION, EXPERIMENTAL DATA, PRESSURE BREATHING

IDENTIFIERS: MARK-V HELMETS, (2)DIVING HELMETS,  
LOW PRESSURE BREATHING APPARATUS

(U)

(U)

THIS REPORT PRESENTS EXPERIMENTAL RESULTS OF A TESTING PROGRAM FOR DETERMINING MIXING EFFECTIVENESS FACTORS AND REQUIRED VENTILATION RATES FOR U. S. NAVY MARK V DIVING HELMETS. BASED UPON THE EXPERIMENTAL RESULTS AND DATA THE FOLLOWING ARE CONCLUDED: PREVIOUS VENTILATION CALCULATIONS BASED ON A MIXING EFFECTIVENESS FACTOR OF 1.0 WERE CONSERVATIVE; A DATA BASE WAS OBTAINED TO MORE ACCURATELY PREDICT REQUIRED VENTILATION RATES FOR HARD HAT DIVING; THE DATA BASE FOR THE MARK V SHOULD PROVE TO BE A VALUABLE TOOL FOR COMPARING THE EFFECTIVENESS OF OTHER VENTILATED HELMETS.

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AU-715 344 5/10 8/19  
NAVY EXPERIMENTAL DIVING UNIT WASHINGTON D C

MEMORY IMPAIRMENT DURING A DEEP HELIUM  
DIVE. (U)

DESCRIPTIVE NOTE: FINAL REPT.,  
7U UP DIERSEN, ROBERT J. & CAMERON,  
BERNARD J.;  
REPT. NO. NEDU-RH-13-70  
PROJ. H4300.G1-1U040

UNCLASSIFIED REPORT  
AVAILABILITY: PUB. IN AEROSPACE MEDICINE, V41 NO  
P650-661 JUN 70.

DESCRIPTIONS: (DIVING, MEMORY),  
(STRESS(PSYCHOLOGY), DIVING),  
(STRESS(PHYSIOLOGY), DIVING), UNDERWATER,  
ENVIRONMENT, HELIUM, NARCOTICS,  
PERFORMANCE(HUMAN) (U)

IDENTIFIERS: \*HYPERBARIC ATMOSPHERES, \*HELUM  
ATMOSPHERES (U)

TWENTY DIVERS PERFORMED AN ASSOCIATIVE MEMORY TASK  
AT THREE INTERVALS DURING A SATURATION DIVE: ONCE AT  
THE SURFACE, A SECOND TIME AT A DEPTH OF 600 FEET,  
AND A THIRD TIME DURING ASCENT AT 100 FEET. MEMORY  
TESTED AFTER A 60 MINUTE DELAY AT 600 FEET WAS  
SIGNIFICANTLY POORER THAN 60 MINUTE MEMORY TESTED ON  
THE SURFACE OR AT 100 FEET. IT WAS CONCLUDED THAT  
THE SELECTIVE IMPAIRMENT RESULTED FROM PSYCHOLOGICAL  
STRESS RATHER THAN HELIUM NARCOSIS, SINCE 5 MINUTE  
MEMORY WAS NOT IMPAIRED AT 600 FEET, AND 60 MINUTE  
MEMORY REMAINED COMPLETELY INTACT IN SEVERAL  
INSTANCES. THIS STUDY PROVIDES EVIDENCE SUGGESTING  
THAT PSYCHOLOGICAL STRESS MAY BE AN IMPORTANT FACTOR  
IN INFLUENCING PERFORMANCE AT EXTREME DEPTHS.  
(AUTHUR) (U)

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UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-715 671 5/9 5/10  
BIUMARINE INDUSTRIES INC DEVON PA

A STUDY OF DIVER PERFORMANCE WITH  
COMMUNICATION AIDS.

(U)

DESCRIPTIVE NOTE: REPT. FOR 1 FEB-30 SEP 70 ON PHASE  
1,

OCT 70 61P THOMPSON,BRENDAN P. ;  
THOMPSON,CARL L. ;  
REPT. NO. UWCP-70-3  
CONTRACT: NDUU14-70-C-0102

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DESCRIPTORS: (+DIVING, PERFORMANCE(HUMAN)),

(+UNDERWATER COMMUNICATION SYSTEMS, +VOICE  
COMMUNICATION SYSTEMS), TRAINING

IDENTIFIERS: +DIVERS, TEKTITE 2 PROJECT

(U)

(U)

AN EVALUATION OF THE PERFORMANCE OF A DIVER WITH  
COMMUNICATION WAS ATTEMPTED IN TWO EXPERIMENTS. THE  
MAJOR EXPERIMENT INVOLVED THE OBSERVATION OF THE USE  
OF UNDERWATER COMMUNICATORS BY SATURATED SCIENTIFIC  
DIVERS ON THE TEKTITE II PROGRAM. THE SECONDARY  
EXPERIMENT INVOLVED THE EXAMINATION OF COMMUNICATIONS  
WITH CLOSED CYCLE DIVING EQUIPMENT. DATA ON  
SATURATED DIVERS, THOUGH NOT EXTENSIVE, SHOWED THAT  
COMMUNICATION EQUIPMENT PERFORMANCE AND TRAINING WERE  
PRIMARY FACTORS IN INFLUENCING DIVER PERFORMANCE.  
COMMUNICATIONS WITH CLOSED CYCLE EQUIPMENT SHOWED A  
CONSIDERABLE QUALITATIVE IMPROVEMENT AS COMPARED TO  
OPEN CYCLE EQUIPMENT, DUE TO LACK OF EXHAUST GAS  
INTERFERENCE. (AUTHOR)

(U)

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UDL REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AU-716 414 5/9 13/80  
NAVAL PERSONNEL AND TRAINING RESEARCH LAB SAN DIEGO  
CALIF

SEA STATES AND SHIPBOARD OPERATOR  
PERFORMANCE AND MAINTENANCE. (U)

DESCRIPTIVE NOTE: FINAL REPT.,  
DEC 70 60P LACEY, LYNN A.  
REPT. NO. SRM-71-S

UNCLASSIFIED REPORT

DESCRIPTORS: \*PERFORMANCE(HUMAN), SHIPBORNE,  
(\*OCEAN WAVES, PERFORMANCE(HUMAN)), MOTION,  
MOTION SICKNESS, ATTRITION, RADAR OPERATORS,  
RADIO OPERATORS, SONAR PERSONNEL, SHIPS,  
ELECTRONIC EQUIPMENT, ATTITUDES, QUESTIONNAIRES,  
STABILIZATION, MARINE ENGINEERING (U)

IDENTIFIERS: \*SHIP CREWMEMBERS, \*SEA STATES,  
SEMISUBMERGED SHIPS, ROUGH SEAS (U)

THE PURPOSE OF THE RESEARCH IS TO EVALUATE THE  
EFFECTS OF SEA STATES ON THE OPERATION AND  
MAINTENANCE OF RADAR, RADIO, AND SONAR SHIPBOARD  
EQUIPMENT. LITTLE RESEARCH HAS BEEN CONDUCTED ON  
THE EFFECTS OF SEA STATE CONDITIONS ON THE OPERATION  
AND MAINTENANCE OF SHIPBOARD EQUIPMENT. THE PRESENT  
RESEARCH EXTENDS THE AVAILABLE DATA ON THE EFFECTS OF  
SEA STATES. OPERATION AND MAINTENANCE EVALUATION  
QUESTIONNAIRES, REQUIRING EVALUATION OF THE EFFECTS  
OF SEA STATES, WERE ADMINISTERED TO STUDENTS AND  
INSTRUCTORS AT CLASS B AND C SCHOOLS. BOTH  
OPERATOR AND MAINTAINER PERFORMANCE ARE REPORTED TO  
BE HINDERED AT HIGH SEA STATES, BUT MOST SHIP  
OPERATING TIME IS AT LOW SEA STATES. EQUIPMENT  
PERFORMANCE IS REPORTED TO BE MORE GREATLY HINDERED  
AT HIGHER SEA STATES THAN AT LOWER SEA STATES. A  
GREATER AMOUNT OF EQUIPMENT MAINTENANCE IS REPORTED  
TO BE REQUIRED AT HIGHER SEA STATES THAN AT LOWER SEA  
STATES. (AUTHOR) (U)

UNCLASSIFIED

UDL REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-716 332 5/5 13/10  
GENERAL DYNAMICS CORP GRUION CONN ELECTRIC BOAT DIV

CAPABILITIES OF OPERATORS AS DIVERS VS  
SUBMERSIBLE MANIPULATOR CONTROLLERS IN  
UNDERSEA TASKS. (U)

JUN 70 112P PESCH, ALAN J.; HILL, ROBERT  
G. KLEPSER, WILLIAM F., JR;  
REPT. NO. U417-70-U43  
CONTRACT: NO0014-69-C-0168  
PROJ: NK-196-U90

UNCLASSIFIED REPORT

DESCRIPTIONS: (+SCUBA DIVERS,  
PERFORMANCE(HUMAN)), (+UNDERWATER VEHICLES:  
AUTOMATION), (+SALVAGE, EFFECTIVENESS), COST  
EFFECTIVENESS, TIME, STATISTICAL PROCESSES,  
CORRELATION TECHNIQUES, TEST METHODS, SIMULATION,  
AIR, UNDERWATER, REMOTE CONTROL SYSTEMS,  
HANDS (U)

IDENTIFIERS: EVALUATION, COMPARISON,  
MANIPULATORS, UNDERWATER TASKS (U)

THE MAJOR OBJECTIVE OF THE RESEARCH PROGRAM WAS TO  
ANALYZE, EMPIRICALLY EVALUATE, AND QUANTIFY THE  
CAPABILITIES OF THE HUMAN OPERATOR TO PERFORM APPLIED  
UNDERSEA WORK TASKS AS A DIVER, IN COMPARISON TO HIS  
ROLE AS THE OPERATOR OF A MANIPULATOR-EQUIPPED SMALL  
SUBMERSIBLE. EXPERIMENTAL DATA WAS COLLECTED  
UTILIZING A SMALL SUBMERSIBLE MUCKUP WITH AN ACTUAL  
VIEWPORT LOOKING INTO A WATER-FILLED TANK IN WHICH A  
MANIPULATOR AND TASK WERE LOCATED. THE EXPERIMENT  
CONSISTED OF TYPICAL APPLIED SALVAGE TASKS SUCH AS  
SAMPLE COLLECTING, RIGGING AND HOUKING, VALVE  
TURNING, CONNECTING AND DISCONNECTING A HANSEN  
QUICK DISCONNECT, DRILLING, TAPPING, THREADING, AND  
UNBOLTING. PERFORMANCE MEASURES WERE TAKEN FOR EACH  
OF THE TASKS AND THE BEHAVIORAL SEGMENTS WITHIN THE  
TASKS. THE WORK SYSTEMS UNDER STUDY INCLUDED  
DIVERS AND VARIOUS MANIPULATOR CONTROL SYSTEMS  
(+JOYSTICK, VARIABLE RATE; JOYSTICK, FIXED RATE; AND  
PUSHBUTTON, FIXED RATE). (AUTHOR) (U)

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DOL REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AD-717 66J 6/14  
OFFICE OF NAVAL RESEARCH ARLINGTON VA

PRINCIPLES AND OBSERVATIONS ON THE PHYSIOLOGY  
OF THE SCUBA DIVER, (PRINCIPI ED OSSERVAZIONI  
DI FISIOLOGIA DEL SOMMOZZATORE). (U)

7U 334P ALBANO, GASPARONE ;  
REPT. NO. UMN-DR-150

UNCLASSIFIED REPORT  
AVAILABILITY: PAPER COPY AVAILABLE FROM  
SUPERINTENDENT OF DOCUMENTS, GPO, WASHINGTON, D.  
C. 20402. ORDER AS: D21U-15:DR-150. PRICE:  
\$2.50.

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH  
INTERNATIONAL LABORATORY FOR UNDERWATER MEDICINE,  
PALERMO (ITALY).

DESCRIPTORS: (\*STRESS(PHYSIOLOGY), \*DIVING),  
PHYSIOLOGY, UNDERWATER, ENVIRONMENT,  
PERFORMANCE(HUMAN), BODY TEMPERATURE,  
RESPIRATION, HIGH-PRESSURE RESEARCH,  
CARDIOVASCULAR SYSTEM, DECOMPRESSION SICKNESS,  
PRESSURE BREATHING, OXYGEN, NERVOUS SYSTEM,  
NERVOUS SYSTEM DISEASES, PATHOLOGY, ITALY (U)  
IDENTIFIERS: TRANSLATIONS, HYPERBARIC ATMOSPHERES, (U)  
HYPERBARIC OXYGENATION, \*UNDERWATER SWIMMERS (U)

CONTENTS: DIRECT EFFECTS OF UNDERWATER  
ENVIRONMENT ON THE BODY AND ON CONDITIONS OF  
UNDERWATER WORK; THE HYPERBARIC HUMERAL SYNDROME;  
THERMOREGULATION AND THE DIVER'S ENERGY NEEDS;  
HYPERBARIC RESPIRATION; THE HYPERBARIC  
CARDIOVASCULAR SYNDROME; NEUROPSYCHIC FUNCTIONS  
DURING HYPERBARIC BREATHING OF SEVERAL MIXTURES;  
THE PROBLEM OF DECOMPRESSION; MIXTURES,  
APPARATUS, AND DECOMPRESSION PRACTICE; PHYSIOLOGY  
OF SKIN DIVING. (U)

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UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU#17 VOL 13/4 S/S 13/10  
OCEANAUTICS INC SAN DIEGO CALIF

HUMAN ENGINEERING CRITERIA FOR THE DESIGN OF  
DIVER-OPERATED UNDERWATER TOOLS. (U)

DESCRIPTIVE NOTE: ANNUAL SUMMARY REPT., OCT 69-SEP 70,  
JAN 71 79P ANDERSEN, BIRGER G.;  
REPT. NO. CI-TK-1/1-5K  
CONTRACT: NODU14-70-C-0070  
PROJ: NN-196-095

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SMALL TOOLS, DESIGN), (\*HUMAN  
ENGINEERING, UNDERWATER EQUIPMENT), (\*UNDERWATER  
EQUIPMENT, SMALL TOOLS), TORQUE, STANDARDS,  
SCREWDRIVERS, IMPACT WRENCHES, PERFORMANCE TESTS,  
DIVING (U)  
IDENTIFIERS: NUTRUNNERS, \*HAND TORQUEING TOOLS,  
HAND WRENCHES, UNDERWATER TASKS (U)

THE REPORT SUMMARIZES THE RESULTS OF A RESEARCH  
STUDY CONDUCTED TO DEVELOP A USER-ORIENTED DESIGN  
CRITERIA GUIDE FOR DIVER-OPERATED UNDERWATER TOOLS.  
THE TOOLS COVERED IN THIS PHASE OF THE STUDY WERE  
LIMITED TO THE CATEGORY OF TOOLS USED IN THE  
PERFORMANCE OF TORQUEING TASKS. THE RATIONALE FOR  
THE DEVELOPMENT OF DESIGN CRITERIA IS PRESENTED FOR  
THOSE HAND AND POWER OPERATED TORQUEING TOOLS USED BY  
MILITARY AND COMMERCIAL DIVERS IN THE SUPPORT OF  
UNDERWATER CONSTRUCTION AND SALVAGE OPERATIONS. THE  
TOOL ITEMS STUDIED INCLUDE SCREWDRIVERS, NUTRUNNERS,  
HAND WRENCHES, AND PNEUMATIC AND HYDRAULIC POWERED  
IMPACT WRENCHES. THE APPLICATIONS OF SPECIFIC TOOL  
ITEMS ARE DISCUSSED IN RELATION TO THE PERFORMANCE OF  
OPERATIONAL UNDERWATER WORK TASKS. DESIGN CRITERIA  
ARE PRESENTED, BASED ON DIRECT OBSERVATION AND  
PARTICIPATION IN UNDERWATER TOOL OPERATIONS,  
AVAILABLE TOOL PERFORMANCE DATA, APPLICABLE HUMAN  
ENGINEERING RESEARCH DATA, AND THE OPERATIONAL  
EXPERIENCE OF COMMERCIAL AND MILITARY DIVERS.

(AUTHOR) (U)

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DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD#710 413            5/10  
ARIZONA STATE UNIV TEMPL

SYSTEMS ANALYSIS AND MODELING OF SMALL  
GROUPS: ISOLATION AND SEALAB. (U)

DESCRIPTIVE NOTE: FINAL TECHNICAL REPT. 1 OCT 62-31  
MAR 63.  
MAR 63 ISP            BACHRACH, ARTHUR J. ;  
REPT. NO. UZULU71  
CONTRACT: N0NR-2194(U3)  
PROJ: AR-171-143

UNCLASSIFIED REPORT

DESCRIPTIONS: (GROUP DYNAMICS, MATHEMATICAL  
MODELS), (CONFINED ENVIRONMENTS, GROUP  
DYNAMICS), VERBAL BEHAVIOR, GROUP DYNAMICS,  
PERFORMANCE(HUMAN), GAME THEORY,  
STRESS(PSYCHOLOGY), DATA PROCESSING SYSTEMS,  
UNDERWATER VEHICLES (U)

IDENTIFIERS: HANDED SUBMERSTOLES, SYSTEMS  
ANALYSIS, REINFORCEMENT(PSYCHOLOGY), STIMULUS  
CONTROL, ISOLATION, SEALAB 2,  
CONFINEMENT(PSYCHOLOGY) (U)

MUCH OF THE RESEARCH ACCOMPLISHED WAS CONTINUATION  
AND EXPANSION OF WORK IN EXPERIMENTAL ANALYSIS OF  
BEHAVIOR UNDER A PREVIOUS CONTRACT AT THE  
UNIVERSITY OF VIRGINIA. EARLY RESEARCH AT  
ASU WAS DIRECTED TOWARD DEVELOPING STABLE BASELINES  
AND STIMULUS CONTROL TECHNIQUES TO ANALYZE GROUP  
PHENOMENA FROM AN EXPERIMENTAL STANDPOINT. IN THE  
SECOND YEAR THE INVESTIGATORS STARTED TO DIRECT  
ATTENTION OF THE PAY-OFF MATRICES AS DESCRIBED IN  
GAME THEORY TO REINFORCEMENT AND REINFORCEMENT VALUE,  
WHICH IN TURN, LED TO MORE EXTENSIVE EXPLORATION OF  
THE AREA OF COMPETITION. ENSUING YEARS WERE  
DEVOTED TO AN INVESTIGATION OF SPECIFIC GROUP  
PHENOMENA SUCH AS COMPETING CONTINGENCIES, AGAIN  
WITHIN THE MATRIX OF GAME THEORY, WHICH INDICATED  
THAT THERE WAS A THREE-FOLD FUSION OF GAME THEORY  
ORIENTATION WITH PAY-OFF MATRICES AS A QUANTITATIVE  
METHOD OF ESTABLISHING VALUE AND OPERANT CONDITIONING  
TECHNIQUES. THIS LED TO EXPLORATION OF SYSTEMS  
ANALYSIS AS A MEANS OF ANALYZING CONDITIONING  
PROCEDURES IN GROUP EVENTS. (AUTHOR) (U)

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DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-710 455 6/7 13/10-1 5/5  
NAVAL SUBMARINE MEDICAL CENTER GRUTIN CONN SUBMARINE  
MEDICAL RESEARCH LAB

HUMAN FACTORS EVALUATION OF SUBMARINE  
ESCAPE: INDIVIDUAL AND GROUP ESCAPE  
WITH THE BRITISH SUBMARINE ESCAPE IMMERSION  
SUITS AND THE STEINKE HOOD UNDER CONDITIONS  
OF SIDE AND TUBE EGRESS. (U)

DESCRIPTIVE NOTE: INTERIM REPT.  
APR 70 28P KYACK, BERNARD L., RODENSKY,  
ROBERT L., WALTERS, GARY B.;  
REPT. NO. SMRL-624  
PROJ: MH12-524-006  
MUNITUR: NAVMEU MH12-524-006-4025B-36

UNCLASSIFIED REPORT Reproduced from  
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DESCRIPTORS: (\*SUBMARINE ESCAPE, HUMAN  
ENGINEERING), DECOMPRESSION SICKNESS, TIME,  
CORRELATION TECHNIQUES, REGRESSION ANALYSIS,  
HATCHES, SUBMARINE PERSONNEL, SEA RESCUE  
EQUIPMENT (U)

IDENTIFIERS: MARK 7 SUBMARINE ESCAPE SUITS,  
STEINKE HOODS, SUBMARINE ESCAPE APPLIANCES,  
\*SUBMARINE ESCAPE SUITS (U)

THE COMPATIBILITY OF THE BRITISH MARK VII  
SUBMARINE ESCAPE IMMERSION SUIT (SEIS) WITH  
SIDE EGRESS AND TUBE EGRESS UNITED STATES NAVY  
ESCAPE TRUNK CONFIGURATIONS WAS EVALUATED. EGRESS  
TIME WITH THE SEIS WAS COMPARED TO THAT WITH THE  
STEINKE HOOD UNDER CONDITIONS OF INDIVIDUAL AND  
GROUP ESCAPE (1, 2, AND 3 MAN TEAMS).  
(AUTHOR) (U)

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UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-72U 976 5/5 5/0 14/2  
ARMY TEST AND EVALUATION COMMAND ABERDEEN PROVING GROUND  
MD

HUMAN FACTORS ENGINEERING. (U)

DESCRIPTIVE NOTE: MATERIEL TEST PROCEDURE.

AUG 67 7UP  
REPT. NO. MTP-6-2-502

UNCLASSIFIED REPORT

DESCRIPTIONS: (+HUMAN ENGINEERING, TEST METHODS),  
(+MAN-MACHINE SYSTEMS, HUMAN ENGINEERING),  
DISPLAY SYSTEMS, CONTROL PANELS, WARNING SYSTEMS,  
AUDITORY PERCEPTION (U)

IDENTIFIERS: COMMON ENGINEERING TEST PROCEDURES,  
AUDITORY WARNING DEVICES, VISUAL DISPLAYS (U)

THE OBJECTIVE OF THE MATERIEL TEST PROCEDURE  
IS TO PROVIDE METHODS OF DETERMINING THE  
APPROPRIATENESS AND EFFECTIVENESS OF HUMAN FACTORS  
ASPECTS AT MAN-MACHINE INTERFACES. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-722 U18 6/19  
NAVY CLOTHING AND TEXTILE RESEARCH UNIT NATICK MASS

A METHOD FOR DETERMINING O<sub>2</sub> AND CO<sub>2</sub> FROM  
TEST SUBJECTS WEARING SCUBA DIVING  
EQUIPMENT UNDER WATER.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
APR 71 IJP REINSDALE A-1  
REPT. NO. TR-94

UNCLASSIFIED REPORT

DESCRIPTORS: (+RESPIRATION, DIVING), (+OXYGEN  
CONSUMPTION, DIVING), (+BREATHING APPARATUS,  
DIVING), (+UNDERWATER EQUIPMENT, RESPIRATION),  
METABOLISM, UNDERWATER CLOTHING, OXYGEN, CARBON  
DIOXIDE, MEASUREMENT, CALORIMETRY  
IDENTIFIERS: SCUBA DIVING EQUIPMENT

(U)  
(U)

A METHOD IS DESCRIBED FOR DETERMINING OXYGEN  
CONSUMPTION FOR INDIRECT CALORIMETRIC CALCULATION OF  
METABOLIC CHANGES FOR MEN UNDER WATER WHILE USING  
STANDARD SCUBA DIVING EQUIPMENT. CARBON DIOXIDE  
IS ALSO MEASURED AND THE RESPIRATORY QUOTIENT (RQ)  
OBTAINED GIVES CREDENCE TO THE ASSUMPTION THAT  
MEASUREMENTS ARE VALID. MEAN RQ FROM 178  
MEASUREMENTS WAS 0.8346 PLUS OR MINUS A STANDARD  
ERROR OF THE MEAN OF .0062. (AUTHOR)

(U)

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UOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-123 174 6/14 13/16  
ASTHO NAUTICAL RESEARCH INC CAMBRIDGE MASS

SATURATION DIVES, WITH EXCURSIONS, FOR THE  
DEVELOPMENT OF A DECOMPRESSION SCHEDULE FOR  
USE DURING SEALAB III.

(U)

DESCRIPTIVE NOTE: RESEARCH REPT.,  
SEP 70 60P KULIU, J. WAYNE ISUMMITT,  
JAMES K.;  
CONTRACT: NCOU24-70-C-5559  
MONITOR: NEDU NM-9-70

UNCLASSIFIED REPORT

DESCRIPTORS: (DIVING, PERFORMANCE(HUMAN)),  
(DECOMPRESSION, SCHEDULING), (UNDERWATER  
VEHICLES, DECOMPRESSION), DEEP SUBMERGENCE,  
BREATHING APPARATUS, DECOMPRESSION SICKNESS,  
HYDROSTATIC PRESSURE

(U)

IDENTIFIERS: SATURATION DIVING, SEALAB 3 MANNED  
SUBMERSIBLE, DECOMPRESSION SCHEDULES, MANNED  
SUBMERSIBLES, SATURATION-EXCURSION DIVING, ASCENT  
RATE

(U)

TWENTY-THREE SATURATION DIVES TO DEPTHS OF 200 TO  
850 FEET WERE CONDUCTED AT THE US NAVY  
EXPERIMENTAL DIVING UNIT TO VERIFY A  
DECOMPRESSION SCHEDULE FOR USE AT SEALAB III.  
SEVENTY-ONE DIVERS COMPLETED NINETY-SEVEN MAN-DIVES  
AND TESTED DECOMPRESSION SCHEDULES BASED ON TWO  
DIFFERENT FUNDAMENTAL RATES OF ASCENT DURING THE DIVE  
SERIES. SEVENTY-FOUR MAN-EXCURSION DIVES WERE  
CONDUCTED DURING THE SERIES, INCLUDING A RECORD-  
BREAKING EXCURSION TO A DEPTH OF 1045 FEET. A  
DECOMPRESSION SCHEDULE FOR USE FROM A DEPTH OF 600  
FEET WAS DEVELOPED AND FOUND TO BE SAFE FOR USE  
DURING SEALAB III. EIGHT CASES OF DECOMPRESSION  
ILLNESS OCCURRED DURING THE DIVE SERIES. DETAILS  
OF THESE CASES ARE COVERED IN THE REPORT.

(U)

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UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-123 177 6/19  
NAVY EXPERIMENTAL DIVING UNIT WASHINGTON D C

REPORT OF EXPERIMENTAL DIVES FOR SEALAB III  
SURFACE SUPPORT DECOMPRESSION SCHEDULES. (U)

DESCRIPTIVE NOTE: FINAL REPT.,  
DEC 70 12UP CHOWLEY, RICHARD W. ;SUMMIT,  
JAMES K. ;

REPT. NO. NEUU-RH-15-70

Reproduced from  
best available copy.

UNCLASSIFIED REPORT

DESCRIPTORS: (•DIVING, DECOMPRESSION),  
(•DECOMPRESSION, SCHEDULING), (•UNDERWATER  
VEHICLES, DECOMPRESSION), DECOMPRESSION SICKNESS,  
BREATHING APPARATUS, SCUBA DIVERS, TABLES (U)

IDENTIFIERS: SEALAB 3 MANNED SUBMERSIBLE,  
•DECOMPRESSION SCHEDULES (U)

THE REPORT DESCRIBES THE DECOMPRESSION SCHEDULES  
THAT WERE DEVELOPED AND TESTED BY THE U.S. NAVY  
EXPERIMENTAL DIVING UNIT (NAVXDIVINGU) IN  
PREPARATION FOR SEALAB III. THE NEED WAS  
FORESSEEN FOR A SURFACE SUPPORTED DIVING CAPABILITY  
FOR UNDERWATER TASKS OF RELATIVELY SHORT DURATION  
WHICH WOULD NOT NECESSITATE THE USE OF SATURATION  
DIVING WITH ITS RESULTING LUNG DECOMPRESSION TIMES.  
THE DECOMPRESSION SCHEDULES DESCRIBED IN THE REPORT  
WERE DESIGNED TO PROVIDE THAT CAPABILITY. THE  
REPORT PRESENTS EACH DEVELOPMENTAL DECOMPRESSION  
SCHEDULE AND SUMMARIZES THE EXPERIMENTAL DIVES THAT  
WERE MADE TO EVALUATE THEM. PROBLEMS ENCOUNTERED,  
PARTICULARLY PROBLEMS OF DECOMPRESSION SICKNESS, ARE  
ALSO SUMMARIZED. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AUT/20 140 5/8  
GENERAL DYNAMICS CORP GROTON CTN ELECTRIC BOAT DIV

MULTIPLE DISPLAY MONITORING. III.  
TRACKING WHILE MONITORING.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
MAY 60 23P KAUFMAN, HERBERT M., BLAIR,  
BESLER C.;  
REPT. NO. SP606-U44, P60-014

UNCLASSIFIED REPORT

DESCRIPTIONS: (•TRACK-WHILE-SCAN,  
•PERFORMANCE(MAN-N)), (•MAN-MACHINE SYSTEMS,  
MONITORS), DISPLAY SYSTEMS, PERFORMANCE TESTS,  
SUBMARINE PERSONNEL, TRACKING, CORRELATION  
TECHNIQUES, AUTOMATION

(U)

IDENTIFIERS: PSYCHOMOTOR TASKS

(U)

THE STUDY IS THE THIRD IN A SERIES WHICH IS  
CONCERNED WITH MAN AS A MONITOR. THESE STUDIES ARE  
RELATED TO THE PROBLEMS ENCOUNTERED IN AUTOMATIC AND  
SEMIAUTOMATIC SYSTEMS, AND IN THE MODERN SUBMARINE IN  
PARTICULAR, WHERE A MAN MUST DETECT AND CONTROL  
INCOMING SIGNALS. THE STUDY WAS DESIGNED TO OBTAIN  
PERFORMANCE MEASURES WHEN SS HAD A TWO-FOLD TASK,  
THAT OF COMPENSATORY TRACKING ON ONE DISPLAY  
(KEEPING A POINTER ON TARGET) WHILE MONITORING  
TWO OTHER DISPLAYS FOR DISCRETE, STEADY-STATE  
SIGNALS.

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

ADM726 161 13/9 5/4 13/10  
NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF

TECHNICAL EVALUATION OF DIVER-HELD POWER  
TOOLS.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT. NOV 68-JUN 70,  
JUN 71 GUP BLACK, S. A.; BARNETT, F.  
B.;

REPT. NO. NCEL-TK-124  
PROJ: 1F38-535.043-01.002

UNCLASSIFIED REPORT

Reproduced from  
best available copy.

DESCRIPTIONS: \*SMALL TOOLS, UNDERWATER EQUIPMENT),  
(\*PERFORMANCE(HUMAN), UNDERWATER EQUIPMENT),  
UNDERWATER CUTTING, SAWS, IMPACT WRENCHES,

(U)

GRINDERS, PNEUMATIC SYSTEMS, HYDRAULIC SYSTEMS,  
SCUBA DIVERS, QUESTIONNAIRES, TIME STUDIES

IDENTIFIERS: UNDERWATER MAINTENANCE, EVALUATION,  
\*UNDERWATER POWER TOOLS, \*DIVERS, \*IMPACT

(U)

TOOLS

(U)

PNEUMATIC AND HYDRAULIC HAND-HELD POWER TOOLS WERE  
EVALUATED BY DIVERS PERFORMING REALISTIC UNDERWATER  
TASKS. THESE TASKS INCLUDED DRILLING STEEL AND  
ALUMINUM, NUT RUNNING AND TIGHTENING, GRINDING METAL,  
AND CHAIN SAWING WOOD. AN ON-THE-SITE OBSERVER  
MONITORED DIVER PERFORMANCE TIME FOR EACH TASK.

DIVER SKILL IN EFFECTIVE TOOL UTILIZATION IS VERY  
IMPORTANT IN WORKING UNDERWATER. AT TEST DEPTHS TO  
60 FEET, HYDRAULIC TOOLS WERE VERY EFFECTIVE AND  
PRACTICAL, WHILE PNEUMATIC TOOLS, ALTHOUGH EFFECTIVE,  
REQUIRED EXCESSIVE MAINTENANCE. AT GREATER DEPTHS,  
HYDRAULIC TOOLS RETAIN THEIR EFFECTIVENESS, BUT  
PNEUMATIC TOOLS LOSE EFFECTIVENESS BECAUSE OF THE  
COMPRESSIBILITY OF GAS. HYDRAULIC TOOLS GENERALLY  
SUPPLY MORE ENERGY PER UNIT OF TOOL WEIGHT THAN DO  
PNEUMATIC TOOLS; THUS, THE DIVER CAN PERFORM WORK  
MORE RAPIDLY USING HYDRAULIC TOOLS. (AUTHOR)

(U)

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DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AU-726 225 5/9 5/10 17/2  
BIOMARINE INDUSTRIES INC DEVON MA

A STUDY OF DIVER PERFORMANCE WITH  
COMMUNICATION AIDS.

(U)

DESCRIPTIVE NOTE: FINAL REPT. 30 SEP 70-30 JUN 71 ON  
PHASE 2.

JUN 71 S/P THOMPSON, BRENDAN P. ;  
STREIMEN, IRVING R. ;  
REPT. NO. UNCP-70-15  
CONTRACT: NOOU14-70-C-0162  
PROJ: NM-197-UUB

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO REPORT DATED OCT 70. AD-  
715 671.

DESCRIPTORS: (DIVING, PERFORMANCE(HUMAN));  
(UNDERWATER COMMUNICATION SYSTEMS, \*VOICE  
COMMUNICATION SYSTEMS), BREATHING APPARATUS,

HELUM, OXYGEN  
IDENTIFIERS: \*DIVERS

(U)  
(U)

THE PERFORMANCE OF TWO DIVERS WORKING AT 33 FT. ON  
A COMMUNICATION DEPENDENT TASK WAS OBSERVED AND  
MEASURED. COMPARISONS BETWEEN PRODUCTIVITY AND  
ERROR GENERATION USING CLOSED AND OPEN CYCLE  
BREATHING APPARATUS, AS WELL AS HELIUM/OXYGEN,  
NITROGEN/OXYGEN AND ARGON/OXYGEN MIXTURES, WERE MADE.  
MEASUREMENT OF OXYGEN UPTAKE AND CARBON DIOXIDE  
PRODUCTION DURING THE COMMUNICATION TASK, AS WELL AS  
FOR A SERIES OF CONSTANT SWIM RATES, WAS RECORDED.  
NO SIGNIFICANT DIFFERENCE IN PRODUCTIVITY WAS NOTED  
FOR ANY GAS MIXTURE OR BREATHING APPARATUS USED.  
SIGNIFICANT DIFFERENCES WERE NOTED IN ERROR  
GENERATION FOR THE HELIUM/OXYGEN MIXTURE. IN  
ADDITION, THE DISTRIBUTION OF ERRORS BETWEEN SPECIFIC  
LETTER-NUMBER PAIRS AND SOUND GROUPS DIFFERED  
SIGNIFICANTLY FOR HELIUM/OXYGEN MIXTURES. OXYGEN  
UPTAKE DURING THE COMMUNICATION TASK WAS EQUIVALENT  
TO THAT PREVIOUSLY MEASURED FOR SELF-PACED WORK.

(AUTMUN)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

ADP726 427 13/10 5/5  
DUNLAP AND ASSOCIATES INC DARIEN CONN

STUDY, FEASIBILITY OF UNDERSEA SALVAGE  
SIMULATION.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
MAY 71 95P BOHEN, H. H.; HALE, ALLEN;  
CONTRACT: N61339-69-C-0116  
MONITOR: NAVTRADEVLEN 69-C-0116-1

UNCLASSIFIED REPORT

DESCRIPTIONS: (SALVAGE, UNDERWATER EQUIPMENT),  
(HUMAN ENGINEERING, DIVING), REVIEWS,  
SIMULATION, MILITARY PERSONNEL, UNDERWATER  
VEHICLES, UNDERWATER CLOTHING, TRAINING, DEEP  
WATER, LIFE SUPPORT  
IDENTIFIERS: UNDERWATER SALVAGE

(U)  
(U)

THE STUDY REVIEWS MAN'S INVOLVEMENT IN UNDERSEA  
SALVAGE OPERATIONS AS CONDUCTED BY THE NAVY AND  
DEFINES THE RELEVANT TRAINING REQUIREMENTS. NAVAL  
SALVAGE SYSTEMS ARE MOBILIZED FROM SPECIALIZED  
AND GENERAL PURPOSE EQUIPMENTS. THE CONFIGURATION  
OF ANY SALVAGE SYSTEM IS DETERMINED BY THE SALVAGE  
TASK. THERE ARE NO 'STANDING' SALVAGE SYSTEMS;  
RATHER, THERE EXISTS A MULTIPLICITY OF COMPONENTS AND  
PERSONNEL OF VARIOUS ABILITIES FROM WHICH AN AD HOC  
SALVAGE SYSTEM IS MOBILIZED. DIVERS REPRESENT AN  
IMPORTANT CAPABILITY. HOWEVER, THE WORK USEFULNESS  
OF DIVERS IS ATTENUATED AT DEEPER DEPTHS AND BY THE  
COMPLEXITY OF THE REQUIRED LIFE SUPPORT SYSTEMS AND  
OTHER EQUIPMENT. ONE-ATMOSPHERE SUBMERSIBLES OFFER  
AN ALTERNATIVE CAPABILITY. A CONSIDERABLE VARIETY  
OF SURFACE SHIPS, SUBMERSIBLES, DIVING SYSTEMS AND  
UNDERWATER TOOLS IS AVAILABLE. A DESCRIPTIVE MODEL  
OF THE MOBILIZATION OF THESE RESOURCES AT A SALVAGE  
SITE IS OFFERED. THE FOLLOWING RECOMMENDATIONS ARE  
DERIVED FROM THIS DESCRIPTIVE MODEL: DIVERS MUST  
BE TRAINED IN WATER; HENCE, TRAINING TANKS ARE  
REQUIRED. SUITABLE FACILITIES ARE DESCRIBED.  
(AUTHUR)

(U)

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DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-72A 711 17/1 5/5  
APPLIED PSYCHOLOGICAL SERVICES INC WAYNE PA SCIENCE  
CENTER

SUMMARY OF HUMAN FACTORS IN SUPPORT OF  
SONAR SYSTEM DEVELOPMENT. (U)

DESCRIPTIVE NOTE: FINAL REPT. IS SEP 67-15 JUL 71,  
JUL 71 31P SIEGEL, ARTHUR I.;  
REPT. NU. 7172-1  
CONTRACT: N00014-68-C-0104  
PROJ: NR-196-078

UNCLASSIFIED REPORT

DESCRIPTORS: (•SONAR EQUIPMENT, •HUMAN  
ENGINEERING), REVIEWS, DESIGN, DISPLAY SYSTEMS (U)

THE REPORT IS PRESENTED IN TWO PARTS. THE FIRST  
PART SUMMARIZES THE SONAR SYSTEM ORIENTED HUMAN  
FACTORS WORK. PART II CONTAINS AN OUTLINE WHICH  
CAN PROVIDE A BASIS FOR A SONAR SPECIFIC MANUAL OF  
HUMAN FACTORS CONSIDERATIONS IN SONAR SYSTEM DESIGN,  
DEVELOPMENT, AND TEST. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-720 141 S/1U 17/1  
HUMAN FACTORS RESEARCH INC GOLETA CALIF

OPERATOR TARGET DETECTION PERFORMANCE AS A  
FUNCTION OF THE NUMBER OF SONAR ECHUES,  
INTERVAL BETWEEN TRANSMISSIONS, AND SIGNAL-TO-  
NOISE RATIO.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
JUN 71 28P ABRAMS, CHARLES; DOOBENEN,  
WILLIAM; KERR, SELENA K.; BUCKNER, DONALD N.;  
REPT. NO. 1700-1  
CONTRACT: N00014-70-C-0186  
PROJ: NR-196-U97

UNCLASSIFIED REPORT

DESCRIPTORS: (+SONAR PERSONNEL,  
PERFORMANCE(HUMAN)), (+SONAR TARGETS,  
DETECTION), SIGNAL-TO-NOISE RATIOS, ANALYSIS OF  
VARIANCE, SONAR EQUIPMENT, DISPLAY SYSTEMS, HUMAN  
ENGINEERING

(U)

A MAJOR GOAL OF DESIGNERS OF ACTIVE SONAR SYSTEMS  
IS TO OBTAIN LONGER TARGET DETECTION RANGES. ONE  
CONSEQUENCE OF LONGER RANGES IS LONGER TIME INTERVALS  
BETWEEN TRANSMISSIONS. ANOTHER IS LOWER SIGNAL-TO-  
NOISE RATIOS AND THUS FEWER TRANSMISSIONS THAT  
PRODUCE PERCEPTIBLE ECHUES FROM A TARGET. THE  
PURPOSE OF THE STUDY WAS TO INVESTIGATE THE EFFECTS  
OF THESE VARIABLES ON OPERATOR TARGET DETECTION  
PERFORMANCE. THE RESULTS INDICATED THE  
DESIRABILITY OF HISTORY OR MEMORY TYPE DISPLAYS WITH  
LONG-RANGE SONAR SYSTEMS TO ENHANCE OPERATOR  
DETECTION PERFORMANCE. (AUTHOR)

(U)

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UDL REPORT BIBLIOGRAPHY SEARCH CUNTHUL NO. /ZMK23

AU-728 244

6/11

NAVY EXPERIMENTAL DIVING UNIT WASHINGTON D C

DETERMINATION OF CHARACTERISTICS OF A SELF-  
CONTAINED DIVING AND SWIMMING OUTFIT OF  
FRENCH DESIGN.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,

FEU 49 IIP BLOCKWIC, THOMAS NO. 1

MOLURPHY, JO G.

REPT. NU. HEOU-RH-5-49

PROJ: MS-106-U12

UNCLASSIFIED REPORT

DESCRIPTIONS: (BREATHING APPARATUS,  
PERFORMANCE(ENGINEERING)), (UNDERWATER  
CLOTHING, DIVING), GAS CYLINDERS, VALVES,  
BREATHING MASKS, RESPIRATION, TESTS, GAS FLOW,  
FRANCE

(U)

IDENTIFIERS: EVALUATION, DEMAND REGULATING VALVES,  
BREATHING RESISTANCE

(U)

THE OBJECT OF THE EXPERIMENT IS TO TEST AND  
DETERMINE THE CHARACTERISTICS OF A SELF-CONTAINED  
DIVING AND SWIMMING OUTFIT OF FRENCH DESIGN. THIS  
OUTFIT CONSISTS OF AN AIR CYLINDER, A DEMAND  
REGULATING VALVE, A MOUTHPIECE, TWO HOSES AND A FACE  
MASK COVERING THE EYES AND NOSE. THERE IS NO  
RECIRCULATING SYSTEM. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-726 251 5/9 15/7  
NAVY EXPERIMENTAL DIVING UNIT WASHINGTON D C

REPORT OF DIVING TRAINING IN USS KITTIWAKE IN  
THE BAY OF PANAMA DURING THE PERIOD 26 MAR TO  
5 MAY 1949.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,  
JUL 44 4P MOLUMPHY, G. G.;  
REPT. NO. NEDU-RN-9-49  
PROJ. NS-186-042

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UNCLASSIFIED REPORT

DESCRIPTORS: (+DIVING, NAVAL TRAINING), (+DEEP  
SUBMERGENCE, DIVING), DECOMPRESSION, TABLES,  
BREATHING APPARATUS, DECOMPRESSION SICKNESS,  
PERFORMANCE(HUMAN), NAVAL PERSONNEL, LIQUID  
LEVEL GAGES

IDENTIFIERS: DIVING EQUIPMENT

(U)  
(U)

THE OBJECTIVES OF THE TRAINING WERE: TO TRAIN  
ALL MEMBERS OF THE DIVING PARTY IN OPERATIONS AT  
RELATIVELY DEEP DEPTHS; TO FURTHER EVALUATE SURFACE  
DECOMPRESSION PROCEDURES; TO TEST MODIFIED DIVING  
GEAR; TO PROVE NEWLY COMPUTED DECOMPRESSION TABLES AT  
SEA; TO PROMOTE CONFIDENCE IN HELIUM OXYGEN EQUIPMENT  
AND DIVING METHODS. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-724 054 8-IU 17/2  
FLORIDA UNIV GAINESVILLE COMMUNICATION SCIENCES LAB

SCIENTIST-IN-THE-SEA, A SYMPOSIUM. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
JUN 71 IUP HOLLIDAY, HARRY ROTHMAN,  
HOKARU;  
REPT. NO. CSL/ONR-32  
CONTRACT: N00014-68-A-0173-0008

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTL: REPORT ON UNDERWATER SPEECH  
COMMUNICATION.

DESCRIPTORS: (OCEANOLOGY, SYMPOSIA), (DIVING,  
DEEP WATER), (UNDERWATER COMMUNICATION SYSTEMS,  
DIVING), UNDERWATER CLOTHING, UNDERWATER  
VEHICLES, TRAINING, BREATHING APPARATUS, AQUATIC  
ANIMALS, SALVAGE, SPEECH, ANESTHESIA, NITROGEN,  
HEARING, VISION, REPORTS (U)

THE SCIENTIST-IN-THE-SEA SYMPOSIUM WAS  
CONDUCTED IN ORDER TO LEARN MORE ABOUT THE ROLE OF  
THE SCIENTIFIC DIVING COMMUNITY IN THE EXPLORATION  
AND UTILIZATION OF HYDROSPACES. THE FOCUS OF THE  
SYMPOSIUM WAS ON THREE MAJOR AREAS: (1)  
THE PROBLEMS ENCOUNTERED BY THE DIVING SCIENTIST  
AND THE STATE OF TECHNOLOGY RELATIVE TO THOSE  
PROBLEMS; (2) AN OVERVIEW OF HOW THE SCIENTIST  
WORKS IN THE SEA; AND (3) DEVELOPMENT OF A  
PROGRAM TO TRAIN SCIENTISTS TO WORK EFFECTIVELY IN  
THE SEA. (AUTHOR) (U)

UNCLASSIFIED

UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-729 657 6/17  
NAVY EXPERIMENTAL DIVING UNIT WASHINGTON D C

THE DETERMINATION OF THE BASIC CONDITION OF  
LIGHTNESS THAT CAN BE ATTAINED BY THE PRESENT  
LIGHTWEIGHT DIVING OUTFIT AND THE UNDERWATER  
SWIM SUIT AND THE EVALUATION OF THEIR  
OPERATING CHARACTERISTICS.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,  
MAR 50 14P BLOCKWICK, THOMAS N.;  
REPT. NO. NEDU-RH-2-50  
PROJ: NS-186-052

Reproduced from  
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UNCLASSIFIED REPORT

DESCRIPTIONS: (UNDERWATER CLOTHING, WEIGHT),  
EFFECTIVENESS, DIVING, BUOYANCY, PROTECTIVE  
MASKS

(U)

THE RESEARCH WAS CONDUCTED TO DETERMINE THE BASIC  
CONDITION OF LIGHTNESS THAT CAN BE ATTAINED BY THE  
PRESENT LIGHTWEIGHT DIVING OUTFIT AND THE UNDERWATER  
SWIM SUIT UNDER VARIOUS DRESS CONDITIONS AND TO  
DETERMINE THE OPERATING CHARACTERISTICS OF THEM SO  
THAT THESE RESULTS CAN BE USED AS A BASIS FOR FUTURE  
IMPROVEMENTS. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-73U 036 13/2  
NORTH AMERICAN ROCKWELL CORP SEAL BEACH CALIF SPACE  
DIV

A METHOD FOR EVALUATION AND SELECTION OF  
DEEP OCEAN LOAD HANDLING SYSTEMS. VOLUME  
1.

(U)

DESCRIPTIVE NOTE: FINAL REPT. 1 JUL 70-12 FEB 71,  
MAY 71 SIUP KNIGHT, R. J., SCURRY, J.,  
E. SIBULING, V. L., MITCHELL, J. C., SHELDON,  
H. H.;  
REPT. NO. SD-71-293-1  
CONTRACT: N62J99-70-C-0024  
MONITOR: NCAL CR-71.009

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH SANTA  
FE INTERNATIONAL, LOS ANGELES, CALIF. REVISION  
OF REPORT DATED JAN 71. SEE ALSO VOLUME 2, AD-73U  
U37.

DESCRIPTIONS: \*(CONSTRUCTION MATERIALS; HANDLING),  
(CONSTRUCTION, UNDERWATER), HOISTS,  
UNDERWATER EQUIPMENT, MATHEMATICAL MODELS,  
COMPUTER PROGRAMS, OPERATION, COSTS, VISIBILITY,  
OCEAN BOTTOM TOPOGRAPHY, ICE, STURMS,  
CLASSIFICATION, IDENTIFICATION, REVIEWS  
IDENTIFIERS: \*DEEP OCEAN LOAD HANDLING (U)  
SYSTEMS, EVALUATION (U)

THE STUDY FOR THE DEVELOPMENT OF A METHOD FOR  
THE EVALUATION AND SELECTION OF DEEP OCEAN  
LOAD HANDLING SYSTEMS WAS CONDUCTED TO ASSIST  
THE U.S. NAVY IN PERFORMING SEAFLOOR  
CONSTRUCTION PROJECTS THROUGH CONSIDERATION OF  
OPERATIONS INVOLVING EQUIPMENT AND TRANSPORT OF  
MATERIALS FOR LOAD IMPLANTATION. THE STUDY HAS  
ACCUMULATED FOUR PRIMARY TASKS: (1) THE  
ASSEMBLAGE AND ORGANIZATION OF DATA; (2) THE  
DEVELOPMENT OF A MATHEMATICAL MODEL WHICH IS  
DESCRIPTIVE OF A GENERALIZED TOTAL DEEP OCEAN  
IMPLANTATION MISSION; (3) TRANSLATION OF THE  
DATA AND MODEL INTO A COMPUTERIZED METHOD TO ENHANCE  
UTILIZATION; AND (4) VALIDATION OF THE METHOD  
THROUGH APPLICATION OF SELECTED CASE EXAMPLES. THE  
METHOD PROVIDES THE CAPABILITY TO EVALUATE ANY  
SELECTED DEEP OCEAN LOAD HANDLING SYSTEM ON THE BASIS  
OF CRITICAL MISSION PARAMETERS. THIS VOLUME  
CONTAINS A SYNOPSIS OF THE STUDY SCOPE OF THE DEEP  
OCEAN LOAD HANDLING MISSION. (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK2J

AU-73U 711 6/7 13/JU-1 6/17 5/5  
NAVAL SUBMARINE MEDICAL RESEARCH LAB GROTON CONN

HUMAN FACTORS EVALUATION OF SUBMARINE  
ESCAPE: II-A. TUP EGRESS WITH THE  
BRITISH SUBMARINE ESCAPE IMMERSION SUIT AND  
THE STEINKE HOOD.

(U)

DESCRIPTIVE NOTE: INTERIM REF. 1  
OCT 76 29P HYACK, BERNARD L.; WALTERS,  
GARY B.;  
REPT. NO. SMRL-644  
PROJ. MF12.524.006  
MONITOR: NAVMED MF12.524.006-4025B-38

UNCLASSIFIED REPORT

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SUPPLEMENTARY NOTE: SEE ALSO AD-718 855.

DESCRIPTIONS: (•SUBMARINE ESCAPE, HUMAN  
ENGINEERING), (•UNDERWATER CLOTHING, SUBMARINE  
ESCAPE), DECOMPRESSION SICKNESS, TIME, HATCHES,  
SUBMARINE PERSONNEL, CORRELATION TECHNIQUES, SEA  
RESCUE EQUIPMENT, TESTS

(U)

IDENTIFIERS: MARK 7 SUBMARINE ESCAPE SUITS,  
•STEINKE HOODS, •SUBMARINE ESCAPE SUITS,  
•SUBMARINE ESCAPE APPLIANCES, SIDE EGRESS ESCAPE  
TRUNKS, TUBE EGRESS ESCAPE TRUNKS, TUP EGRESS  
ESCAPE TRUNKS

(U)

THE BRITISH MARK VII SUBMARINE ESCAPE  
IMMERSION SUIT (SEIS) WHICH PROVIDES THERMAL  
PROTECTION AND THE STEINKE HOOD WHICH DOES NOT,  
WERE EVALUATED FOR SINGLE-MAN AND GROUP ESCAPE (2-  
AND 3-MAN TEAMS) FROM A SIMULATED TOP EGRESS  
UNITED STATES NAVY ESCAPE TRUNK. FOR BOTH  
ESCAPE APPLIANCES, EGRESS TIME INCREASED LINEARLY AS  
A FUNCTION OF TEAM SIZE. THREE-MAN TEAMS AND TWO-  
MAN TEAMS ESCAPED FASTER WITH THE SEIS THAN WITH  
THE STEINKE HOOD; THERE WAS NO DIFFERENCE FOR  
ONE-MAN ESCAPES. SINGLE-MAN ESCAPE TIMES WITH THE  
SEIS WERE COMPARABLE TO THOSE OBTAINED BY THE  
BRITISH. WHEN COMPARED WITH SIDE AND TUBE  
EGRESS, TOP EGRESS OFFERS A SUBSTANTIAL REDUCTION IN  
ESCAPE TIME AND THEREFORE IN TOTAL BOTTOM TIME.  
SAFE ESCAPES FROM DEPTHS IN ACCESS OF 450 FEET BY  
TEAMS OF MORE THAN TWO MEN ARE FEASIBLE FROM A TOP  
HATCH CONFIGURATION BUT ARE NOT POSSIBLE FROM A SIDE  
OR TUBE EGRESS CONFIGURATION. A SUBMARINE ESCAPE  
SYSTEM EMPLOYING TOP EGRESS AND THE EXPOSURE  
PROTECTION OF THE SEIS IS RECOMMENDED.

(AUTHOR)

(U)

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DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AU-731 612 6/17  
NAVY EXPERIMENTAL DIVING UNIT WASHINGTON D C

EVALUATION OF THE NEW TYPE DESCU  
LIGHTWEIGHT DIVING SUIT UP TO A DEPTH OF 99  
FEET UNDER CONDITIONS OF MODERATE WORK. (U)

DESCRIPTIVE NOTE: FINAL REPT.,  
JAN 51 SP BLOCKNICK, THOMAS NO. 1  
REPT. NO. HELU-RH-1-51  
PROJ: NS-186-201

UNCLASSIFIED REPORT

DESCRIPTORS: (UNDERWATER CLOTHING, EFFICIENCY),  
EXERCISE, DIVING, DESIGN, FEASIBILITY STUDIES (U)  
IDENTIFIERS: (DIVING SUITS) (U)

THE OBJECT OF THIS EXPERIMENT IS TO EVALUATE THE  
DESCU LIGHT WEIGHT DIVING SUIT UP TO A DEPTH OF 99  
FEET UNDER CONDITIONS OF MODERATE WORK.  
(AUTHCR) (U)

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/ZMK23

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DDC REPORT BIBLIOGRAPHY SEARCH CONTRUL NO. /ZMK23

AUD731 013 6/17  
NAVY EXPERIMENTAL DIVING UNIT WASHINGTON D C

TEST OF ELECTRICALLY HEATED CLOTHING.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,  
FEB 51 ZUP BLOCKWICK, THOMAS NO. 1  
REPT. NO. NEDU-RK-3-51  
PROJ: NS-186-012

UNCLASSIFIED REPORT

DESCRIPTORS: 1 UNDERWATER CLOTHING, 0 HEATING ELEMENTS, DIVING, WATER, TEMPERATURE, EFFICIENCY

IDENTIFIERS: BOOTS, GLOVES

(U)

(U)

THE OBJECT OF THIS EXPERIMENT IS TO EVALUATE A SET OF ELECTRICALLY HEATED BOOTS AND GLOVES FOR UNDERWATER SWIMMERS UNDER CONDITIONS OF VARIOUS WATER TEMPERATURES. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AU-731 614 6/17  
NAVY EXPERIMENTAL DIVING UNIT WASHINGTON D C

EVALUATION OF THE BRITISH VARBELL SELF  
CONTAINED SWIMMING SUIT.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,  
MAN SI IIP KAITE,CHARLES L. I  
REPT. NO. NEUU-RK-4-51  
PHQJ: NS-166-012

UNCLASSIFIED REPORT

DESCRIPTIONS: "(+UNDERWATER CLOTHING, EFFICIENCY),  
DIVING, BREATHING APPARATUS, FEASIBILITY STUDIES.

(U)

DESIGN  
IDENTIFIERS: "DIVING SUITS

(U)

THE OBJECT OF THIS EXPERIMENT IS TO TEST THE  
BRITISH "VARBELL" SHALLOW WATER SWIMMING UNIT AT  
20, 30 AND 40 FEET UNDER MOLERATE WORKING CONDITIONS.  
(AUTMUR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AU-731 558 13/4 13/10  
NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF

SUBMERSIBLE DIVER TOOL POWER SOURCES;  
ELECTRO-HYDRAULIC AND CRYOGENIC  
PNEUMATIC. (U)

DESCRIPTIVE NOTE: TECHNICAL NOTE JUL 70-JUN 71,  
AUG 71 4IP BLACK&W A+  
REF ID: NCEL-TN-1174  
PROJ: YF38-535.003.01.002

UNCLASSIFIED REPORT

DESCRIPTIONS: (+SMALL TOOLS, +POWER SUPPLIES),  
(+DIVING, SMALL TOOLS), (+CONSTRUCTION,  
UNDERWATER), POWER EQUIPMENT, HYDRAULIC SYSTEMS,  
PNEUMATIC DEVICES, CRYOGENICS, SALVAGE, TEST  
METHODS, DESIGN, PERFORMANCE(ENGINEERING),  
MARINE ENGINEERING (U)

IDENTIFIERS: +ELECTROHYDRAULIC EQUIPMENT,  
+CRYOGENIC PNEUMATIC EQUIPMENT, EVALUATION (U)

TWO SELF-CONTAINED AND COMPLETELY SUBMERSIBLE POWER  
SUPPLIES FOR POWERING DIVER OPERATED HAND HELD TOOLS  
ARE DISCUSSED; ONE POWER SUPPLY OPERATES PNEUMATIC  
TOOLS WHILE THE OTHER OPERATES CLOSED CYCLE OIL  
HYDRAULIC TOOLS. OPERATIONAL EVALUATIONS WERE  
PERFORMED WITH NAVY QUALIFIED DIVERS USING HAND  
HELD TOOLS POWERED BY THE MODULES TO FIND WHETHER  
BOTH CONCEPTS WERE EFFECTIVE AS SUBMERSIBLE POWER  
SOURCES. REFINEMENTS NECESSARY ARE DELINEATED.  
(AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AU-733 443 5/9 5/10  
TEXAS UNIV AUSTIN SOCIAL PSYCHOLOGY LAB

DIAGNOSIS AND PREDICTION: A STUDY OF  
DAILY BEHAVIOR PATTERNS IN TERTITE 2.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
SEP 71 49P BAKER, ROGER ; MELREICH,  
ROBERT ;  
REPT. NO. TR-17  
CONTRACT: NOJ014-67-A-0126-0001  
PHQJ: NH-171-004

UNCLASSIFIED REPORT

DESCRIPTIONS: (PROFESSIONAL PERSONNEL, BEHAVIOR),  
(OCEAN BOTTOM, PROFESSIONAL PERSONNEL),  
SCIENTIFIC RESEARCH, UNDERWATER VEHICLES,  
LABORATORIES, UNDERWATER EQUIPMENT, DECOMPRESSION,  
CLOSED ECOLOGICAL SYSTEMS, DATA PROCESSING SYSTEMS,  
LABOR, ATTITUDES

(U)

IDENTIFIERS: AQUANAUTS, TERTITE 2 PROJECT,  
UNDERWATER HABITATS, MOODS

(U)

SYSTEMATIC OBSERVATIONS OF DAILY BEHAVIOR OF 10  
TEAMS OF AQUANAUTS LIVING FOR A TOTAL OF SEVEN  
MONTHS IN AN UNDERWATER HABITAT ARE REPORTED.  
BEHAVIOR WAS CODED INTO OBJECTIVE CATEGORIES BY  
TEAMS OF OBSERVERS MONITORING ACTIVITY 24 HOURS A  
DAY. CORRELATIONS BETWEEN THESE CATEGORIES FOR  
INDIVIDUAL SUMMARY DATA ARE CONTRASTED WITH THE  
CORRESPONDING POOLED WITHIN-CLASS CORRELATIONS.  
THE LATTER ARE USED HERE AS A STATISTIC MEASURING  
ASSOCIATIVE STRENGTH BETWEEN TIME SERIES VARIABLES  
BOTH WITHIN AND ACROSS INDIVIDUALS. THE USE OF  
BOTH PEARSON AND POOLED CORRELATIONS PROVIDES A  
MORE COMPLETE PICTURE OF DAILY BEHAVIORAL PATTERNS.  
POOLED CORRELATIONS OF LAGGED VARIABLES THEN  
ALLOW EXPLORATION OF CAUSAL LINKAGES. SYSTEMATIC  
OBSERVATIONS AND SELF-REPORT MEASURES ARE CONTRASTED  
IN THEIR ABILITY TO ACCOUNT FOR VARIANCE IN BEHAVIOR.  
THE POTENTIAL APPLICATION OF THIS METHODOLOGY TO A  
VARIETY OF SOCIAL PSYCHOLOGICAL INVESTIGATIONS IS  
DISCUSSED. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-733 444 5/10 6/19  
TEXAS UNIV AUSTIN SOCIAL PSYCHOLOGY LAB

THE LIFE HISTORY QUESTIONNAIRE:  
PREDICTION OF PERFORMANCE IN NAVY DIVER  
TRAINING.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
SEP 71 23P HELMREICH,ROBERT ;BAKEMAN,  
RUGER ;NAULOFF,ROLAND ;  
REPT. NO. TR-18  
CONTRACT: N00014-67-A-0126-DUD  
PROJ: NR-171-804

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SPONSORED IN PART BY NATIONAL  
SCIENCE FOUNDATION, WASHINGTON, D. C.

DESCRIPTORS: (•NAVAL PERSONNEL, BEHAVIOR),  
(•DIVING, NAVAL TRAINING), OCEAN BOTTOM,  
QUESTIONNAIRES, STATISTICAL ANALYSIS, CONFINED  
ENVIRONMENTS, STRESS(PSYCHOLOGY),  
STRESS(PHYSIOLOGY)

IDENTIFIERS: TEKTITE 2 PROJECT

(U)

(U)

THE IMPETUS FOR THE DEVELOPMENT OF THE LIFE  
HISTORY QUESTIONNAIRE WAS A LARGE-SCALE FIELD  
INVESTIGATION OF THE BEHAVIOR OF AQUANAUTS DURING  
PROJECT TEKTITE 2 (HELMREICH, 1971). THE  
GOAL WAS TO UNDERSTAND AND EXPLAIN DIFFERENCES AMONG  
TEKTITE AQUANAUTS IN THEIR ABILITY TO WORK  
EFFECTIVELY UNDERWATER, TO GET ALONG WITH FELLOW  
TEAMMATES, AND TO ADJUST GENERALLY TO A STRESSFUL,  
ISOLATED AND CONFINING ENVIRONMENT.  
(AUTHOR)

(U)

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UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-734 014 5/10  
CALIFORNIA UNIV LOS ANGELES SCHOOL OF ENGINEERING AND  
APPLIED SCIENCE

UNDERWATER WORK MEASUREMENT  
TECHNIQUES:

(U)

DESCRIPTIVE NOTE: FINAL REPT.,  
JUL 71 61P HELTMAN, GERSHON JEGSTROM,  
GLEN H. WILLIS, MICHAEL A. CUCCARO, WILLIAM I.  
REPT. NO. UCLA-ENG-7140  
CONTRACT: N00014-67-A-0111-0007  
PROJ: NR-196-069

UNCLASSIFIED REPORT

DESCRIPTORS: (PERFORMANCE(HUMAN), DIVING),  
MEASUREMENT, TEST EQUIPMENT, TEST FACILITIES,  
HUMAN ENGINEERING, PHYSIOLOGY, DATA PROCESSING  
SYSTEMS, PROGRAMMING(COMPUTERS)

(U)

IDENTIFIERS: TASK PERFORMANCE, UNDERWATER  
TASKS

(U)

THE FOURTH AND CONCLUDING REPORT IS GIVEN IN A  
SERIES DESCRIBING YEARLY PROGRESS OF THE UCLA  
RESEARCH PROJECT ON OPTIMUM UNDERWATER WORK  
MEASUREMENT TECHNIQUES. THE PREVIOUS REPORTS HAVE  
COVERED STUDIES CONDUCTED IN 1967, 1968 AND 1969.  
THIS REPORT, IN ADDITION TO PRESENTING THE TWO  
MAJOR STUDIES CARRIED OUT IN 1970, ALSO PROVIDES A  
SUMMARY OF WORK OVER THE FOUR YEAR PERIOD. THE  
CUMULATIVE LIST OF PROJECT PUBLICATIONS ALLOWS THE  
READER TO IDENTIFY A TOPIC OF CONCERN, DETERMINE  
PRIMARY FINDINGS, AND EXPLORE THE TOPIC FURTHER IN  
THE LITERATURE OR BY REPRINT REQUEST.

(U)

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UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-735 045 S/5 13/10/1  
BUREAU OF NAVAL WEAPONS WASHINGTON D C

HUMAN FACTORS DESIGN STANDARDS FOR THE  
FLEET BALLISTIC MISSILE WEAPONS SYSTEM.  
VOLUME 2. DESIGN OF EQUIPMENT. (U)

AUG 62 332P  
REPT. NO. NAVWEPS-OD-18413A-VOL-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 1, AD-735 044.

DESCRIPTORS: (+HUMAN ENGINEERING, BALLISTIC MISSILE  
SUBMARINES), (+BALLISTIC MISSILE SUBMARINES,  
WEAPON SYSTEMS), MAN-MACHINE SYSTEMS, ELECTRONIC  
EQUIPMENT, CONTROL PANELS, DISPLAY SYSTEMS,  
COMMUNICATION EQUIPMENT, MAINTENANCE EQUIPMENT,  
SYSTEMS ENGINEERING, DESIGN (U)

IDENTIFIERS: DESIGN STANDARDS (U)

THE BASIC OBJECTIVE OF THIS HANDBOOK IS TO PROVIDE  
SPECIAL ASSISTANCE TO SYSTEM AND COMPONENT ENGINEERS  
AND HUMAN FACTORS SPECIALISTS IN PERFORMING THOSE  
PORTIONS OF THEIR ENGINEERING ACTIVITIES WHICH MAY  
RESULT IN THE SPECIFICATION OR DESIGN OF HARDWARE TO  
BE OPERATED AND/OR MAINTAINED ABOARD FBM  
SUBMARINES. VOLUME 2, "DESIGN OF EQUIPMENT,"  
CONTAINS SECTIONS 3 AND 4 OF THE HANDBOOK AND  
PRESENTS INFORMATION ON WHICH TO BASE THE SELECTION,  
UTILIZATION, AND DESIGN OF EQUIPMENT TO ENHANCE HUMAN  
OPERATION AND MAINTENANCE ACTIVITIES AND THUS ACHIEVE  
IMPROVED SYSTEM PERFORMANCE AND AVAILABILITY. (U)

(AUTHOR)

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UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-803 677 17/1 9/2  
GENERAL DYNAMICS CORP GROTON CONN ELECTRIC BOAT DIV

ANALYTICAL INVESTIGATIONS OF DIGITAL INFORMATION  
PROCESSING SYSTEMS. VOLUME I. (U)

DESCRIPTIVE NOTE: PROGRESS REPT. NO. 1, AUG 65-APR 66,  
AUG 66 185P BOOTH, TAYLOR L., GLORIOSO,  
ROBERT M., KAUFMAN, HERBERT M., SLEVY, ROBERT  
M., WALTER, JAMES R. I  
REPT. NO. U417-66-U24-VOL-1  
CONTRACT: N0NR-2512(U0)

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH  
CONNECTICUT UNIV., STORRS.

DESCRIPTORS: (♦)DATA PROCESSING SYSTEMS, ♦SONAR  
RECEIVERS), (♦DIGITAL COMPUTERS, UNDERWATER OBJECT  
LOCATORS), SONAR TARGETS, DETECTION, PASSIVE,  
CONTROL SYSTEMS, EXPERIMENTAL DATA, UNDERWATER  
SOUND SIGNALS, SEQUENCES, SAMPLING, DISPLAY  
SYSTEMS, STATISTICAL ANALYSIS, PROBABILITY, COMBAT  
INFORMATION CENTERS, COMMAND + CONTROL SYSTEMS,  
SUBMARINES (U)

IDENTIFIERS: ♦MAN-MACHINE SYSTEMS, ♦SONAR  
PERSONNEL, PERFORMANCE(HUMAN) (M)

THE AIM OF THIS PROJECT IS TO PROVIDE BASIC  
KNOWLEDGE CONCERNING THE METHODS WHICH MAY BE USED BY  
A MAN-COMPUTER SYSTEM TO DETECT THE PRESENCE OF A  
TARGET USING DATA FROM A PASSIVE SONAR RECEIVER.  
THIS RESEARCH CONSISTS OF ANALYTICAL STUDIES TO  
EVALUATE IMPORTANT SYSTEM PARAMETERS AND EXPERIMENTAL  
INVESTIGATIONS TO MEASURE OPERATOR PERFORMANCE UNDER  
VARIOUS OPERATING CONDITIONS. THE FIRST TWO  
REPORTS EVALUATE THE LOSS IN DETECTION CAPABILITY IF  
CLIPPED DATA RATHER THAN CONTINUOUS DATA IS USED FOR  
DETECTION. UNDER THE ALERTED OPERATOR ASSUMPTION  
IT IS SHOWN THAT, ON THE AVERAGE, FEWER SIGNAL  
SAMPLES ARE REQUIRED TO ACHIEVE A GIVEN DETECTION  
CAPABILITY USING SEQUENTIAL DETECTION TECHNIQUES  
INSTEAD OF FIXED SAMPLE SIZE DETECTION TECHNIQUES.  
THE NEXT TWO REPORTS DESCRIBE METHODS OF IMPROVING  
DETECTION PROBABILITY THROUGH PRE-PROCESSING OF THE  
CLIPPED SIGNAL BEFORE IT IS PRESENTED TO THE OPERATOR  
IN THE FORM OF A BINARY BEARING-TIME DISPLAY. THE  
LAST TWO REPORTS INVESTIGATE METHODS TO ANALYZE THE  
STATISTICAL PROPERTIES OF CORRELATED RANDOM DIGITAL  
SEQUENCES.

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-815 467 5/10 15/1  
HUMAN FACTORS RESEARCH INC LOS ANGELES CALIF

HUMAN FACTOR PROBLEMS IN ANTI-SUBMARINE WARFARE. (U)

DESCRIPTIVE NOTE: FINAL LETTER REPT.,  
MAY 67 11P MACKIE, ROBERT R.;  
CONTRACT: N0NR-2649(U0)  
PROJ: NR-153-199, HFR-206

UNCLASSIFIED REPORT

DESCRIPTORS: (•ANTISUBMARINE WARFARE,  
PERFORMANCE(HUMAN)), (•SONAR PERSONNEL,  
PERFORMANCE(HUMAN)), HUMAN ENGINEERING,  
ATTENTION, TARGET RECOGNITION, TARGET DESIGNATORS,  
RESPONSE, EFFECTIVENESS, SCANNING SONAR,  
MAINTENANCE PERSONNEL, DISPLAY SYSTEMS,  
REACTION(PSYCHOLOGY), MAINTENANCE, TRAINING,  
DESIGN, PERFORMANCE TESTS, TEST  
CONSTRUCTION(PSYCHOLOGY), SONAR TARGETS,

CLASSIFICATION

(U)

IDENTIFIERS: INDIVIDUAL DIFFERENCES

(U)

CONTENTS: HUMAN VIGILANCE AND TARGET  
DETECTION; TARGET DETECTION AND OPERATING  
TECHNIQUE, TARGET CLASSIFICATION TECHNIQUE;  
SONAR MAINTENANCE AND TRAINING; SONAR  
DISPLAYS AND SYSTEMS DESIGN; DEVELOPMENT OF  
TRAINING MATERIALS AND OPERATOR PERFORMANCE  
TESTS; AND PRESENTATIONS AND INFORMATION  
EXCHANGE.

(U)



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UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-833 124 6/19  
OFFICE OF NAVAL RESEARCH LONDON (ENGLAND)

DIVING RESEARCH IN SWITZERLAND.

(U)

MAY 60 14P LIBBER, LEONARD M. S.  
REPT. NO. UNKL-32-68

UNCLASSIFIED REPORT

DESCRIPTORS: ((DIVING, STRESS(PHYSIOLOGY)),  
SCIENTIFIC PERSONNEL, DECOMPRESSION, DECOMPRESSION  
SICKNESS, UNDERWATER EQUIPMENT, PHYSIOLOGY, HIGH-  
PRESSURE RESEARCH, OXYGEN, SAFETY, HAZARDS,  
UNDERWATER VEHICLES, SWITZERLAND

(U)

IDENTIFIERS: SATURATION DIVING

(U)

THIS REPORT DESCRIBES THE CURRENT INTERESTS OF TWO  
PEOPLE WHO HAVE BEEN VERY PROMINENT IN ADVANCING  
MAN'S DEEP DIVING CAPABILITIES: MR. HANNES  
KELLER AND PROF. A. A. BUHLMANN.

ALTHOUGH KELLER IS NOW DEVOTING HIS EFFORTS TO  
THE DESIGN, DEVELOPMENT, AND MANUFACTURE OF IMPROVED  
DIVING EQUIPMENT, BUHLMANN CONTINUES TO WORK ON  
PHYSIOLOGICAL PROBLEMS RELATED TO DEEP DIVING AND  
SATURATION DIVING. THESE EFFORTS ARE REVIEWED.

(AUTHOR)

(U)

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UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-853 517 6/16 5/10  
OFFICE OF NAVAL RESEARCH LONDON (ENGLAND)

A FOLLOW-UP VISIT TO THE ROYAL NETHERLANDS  
NAVY DIVING MEDICAL CENTER, DEN  
HEUER.

(U)

DESCRIPTIVE NOTE: MEMORANDUM REPT.,  
MAY 69 BY BERRY, NEWELL H.; LIBBER,  
LEONARD M.;  
REPT. NO. UNRL-M-14-69

UNCLASSIFIED REPORT

DESCRIPTORS: (DIVING, STRESS(PHYSIOLOGY)),  
OXYGEN, TOXICITY, ELECTROENCEPHALOGRAPHY,  
TRAINING, PERFORMANCE(HUMAN), PERFORMANCE  
TESTS, STATISTICAL DATA, NETHERLANDS

(U)

A DISCUSSION OF THE RESEARCH OBJECTIVES AND  
TECHNIQUES OF THE MEDICAL AND PSYCHOLOGICAL STAFF  
MEMBERS OF THE DIVING MEDICAL CENTRE, DEN  
HEUER, IS PRESENTED. MOST OF THE CURRENT DATA  
COLLECTION IS INVOLVED IN ESTABLISHING BASE LINE  
VALUES ON CANDIDATES ENTERING THE DIVER TRAINING  
PROGRAM. SOME ADDITIONAL DATA ON PHYSIOLOGICAL  
PERFORMANCE ARE COLLECTED ANNUALLY FROM EXPERIENCED  
DIVERS AND UNDERWATER SWIMMERS. THE MOST UNUSUAL  
FINDING IS THE APPEARANCE OF SLIGHT IRREGULARITIES IN  
THE EEG'S OF MEN USING HIGH PRESSURE OXYGEN  
SEVERAL TIMES PER WEEK FOR SEVERAL YEARS. THESE  
DATA MUST BE CAREFULLY ANALYZED BEFORE A CONCLUSION  
CAN BE DRAWN. (AUTHOR)

(U)

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DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AUD-870 L34 6/11 15/7  
ARMY TEST AND EVALUATION COMMAND ABERDEEN PROVING GROUND  
MD

DIVING EQUIPMENT, SCUBA. (U)

DESCRIPTIVE NOTE: FINAL REPT. ON MATERIEL TEST PROCEDURE.  
MAR 70 SUP  
REPT. NO. MTP-10-3-213  
PROJ: MCR-310-6

UNCLASSIFIED REPORT

DESCRIPTORS: (SCUBA DIVERS, BREATHING APPARATUS),  
(BREATHING APPARATUS, TEST METHODS), HUMAN  
ENGINEERING, SAFETY, MAINTENANCE,  
PERFORMANCE(ENGINEERING), OPERATION, ARMED  
FORCES SUPPLIES (U)

IDENTIFIERS: SCUBA(SELF CONTAINED UNDERWATER  
BREATHING APPARATUS), SELF CONTAINED  
UNDERWATER BREATHING APPARATUS, COMMODITY SERVICE  
TEST PROCEDURE (U)

THE ARMY SERVICE TEST PROCEDURE DESCRIBES TEST  
METHODS AND TECHNIQUES NECESSARY TO DETERMINE THE  
DEGREE TO WHICH SELF-CONTAINED UNDERWATER BREATHING  
APPARATUS (SCUBA) DIVING EQUIPMENT, AND ASSOCIATED  
TOOLS AND EQUIPMENT, PERFORM THEIR FUNCTIONS AS  
DESCRIBED IN QUALITATIVE MATERIEL REQUIREMENTS,  
SMALL DEVELOPMENT REQUIREMENTS, MILITARY  
CHARACTERISTICS OR OTHER DEVELOPMENTAL CRITERIA,  
AND TO ASCERTAIN THE SUITABILITY OF THESE ITEMS AND  
THEIR MAINTENANCE PACKAGES FOR SERVICE USE BY THE  
ARMY. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-871 349 6/11

ARMY TEST AND EVALUATION COMMAND ABERDEEN PROVING GROUND  
MD

DIVING EQUIPMENT (HELMETS, BELTS, DIVERS  
DRESS, ETC.).

(U)

DESCRIPTIVE NOTE: FINAL REPT. ON MATERIEL TEST PROCEDURE.

MAK 70 31P

REPT. NO. MTP-10-2-192

PROJ: AMCR-310-6

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DESCRIPTORS: (\*ARMY OPERATIONS, MARINE SAFETY  
EQUIPMENT), (\*MARINE SAFETY EQUIPMENT,  
UNDERWATER), (\*UNDERWATER EQUIPMENT,  
ACCEPTABILITY), UNDERWATER CLOTHING, HELMETS,  
DIVING, SCUBA DIVERS, BREATHING APPARATUS, TEST  
METHODS, HYDROSTATIC TESTS, HUMAN ENGINEERING,  
PERFORMANCE(ENGINEERING), QUALITY CONTROL

(U)

THIS ENGINEERING TEST PROCEDURE DESCRIBES  
TEST METHODS AND TECHNIQUES NECESSARY TO DETERMINE  
THE TECHNICAL PERFORMANCE AND SAFETY CHARACTERISTICS  
OF DIVING EQUIPMENT, AS DESCRIBED IN QUALITATIVE  
MATERIEL REQUIREMENTS (WMR), SMALL  
DEVELOPMENT REQUIREMENTS (SDR), TECHNICAL  
CHARACTERISTICS (TC), AND THEIR SUITABILITY FOR  
SERVICE TESTS. THE DIVING EQUIPMENT IS CATEGORIZED  
AS: SURFACE-SUPPLIES DIVING EQUIPMENT; SELF-  
CONTAINED DIVING EQUIPMENT, INCLUDING SELF-CONTAINED  
UNDERWATER BREATHING APPARATUS (SCUBA); AND DIVING  
ACCESSORIES. (AUTHOR)

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CORPORATE AUTHOR - MONITORING AGENCY

\*APPLIED PSYCHOLOGICAL SERVICES INC  
WATNE PA SCIENCE CENTER

DIGITAL SIMULATION OF THE  
PERFORMANCE OF INTERMEDIATE SIZE  
CREWS. I. LOGIC OF A MODEL FOR  
SIMULATING CREW PSYCHOSOCIAL AND  
PERFORMANCE VARIABLES.  
AD-695 839

7172-1  
SUMMARY OF HUMAN FACTORS IN  
SUPPORT OF SONAR SYSTEM  
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AD-726 711

\*ARCTIC INST OF NORTH AMERICA  
WASHINGTON D C

A SMALL RESEARCH SUBMARINE IN  
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AD-690 428

\*ARIZONA STATE UNIV TEMPE

0201071  
SYSTEMS ANALYSIS AND MODELING  
OF SMALL GROUPS: ISOLATION AND  
SEALAB.  
AD-718 413

\*ARMY TEST AND EVALUATION COMMAND  
ABERDEEN PROVING GROUND MD

MTP-6-2-502  
HUMAN FACTORS ENGINEERING.  
AD-720 776

MTP-10-2-192  
DIVING EQUIPMENT (HELMETS,  
BELTS, DIVERS DRESS, ETC).  
AD-871 349

MTP-10-3-213  
DIVING EQUIPMENT: SCUBA.  
AD-870 034

1970 ANNUAL TECHNICAL SYMPOSIUM

(7TH). MECHANICAL SYSTEMS FOR  
OCEAN ENGINEERING.  
AD-709 393

\*ASTRO NAUTICAL RESEARCH INC CAMBRIDGE  
MASS

SATURATION DIVES, WITH  
EXCURSIONS, FOR THE DEVELOPMENT OF  
A DECOMPRESSION SCHEDULE FOR USE  
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AD-723 174

\*BATTELLE MEMORIAL INST COLUMBUS OHIO  
COLUMBUS LABS

LOW-PRESSURE COMPRESSED AIR  
BREATHING SYSTEMS STUDY. XI. MARK  
V HELMET VENTILATION STUDIES.  
AD-713 395

\*BIOMARINE INDUSTRIES INC DEVON PA

UNCP-70-3  
A STUDY OF DIVER PERFORMANCE  
WITH COMMUNICATION AIDS.  
AD-715 671

UNCP-70-15  
A STUDY OF DIVER PERFORMANCE  
WITH COMMUNICATION AIDS.  
AD-726 225

\*BIOTECHNOLOGY INC ARLINGTON VA

AN INTEGRATED MEASUREMENT  
SYSTEM FOR THE STUDY OF HUMAN  
PERFORMANCE IN THE UNDERWATER  
ENVIRONMENT.  
AD-680 028

\*BIOTECHNOLOGY INC FALLS CHURCH VA

HUMAN PERFORMANCE IN THE  
UNDERSEA ENVIRONMENTS: AN ANNOTATED  
BIBLIOGRAPHY.  
AD-702 781

\*BUREAU OF MEDICINE AND SURGERY  
WASHINGTON D C

0-1  
UNCLASSIFIED

## UNCLASSIFIED

BUR-DEE

\*\*\*  
 NAVMED-MF011.99.9002-4  
 VISION UNDERWATER.  
 AD-660 271  
 \*\*\*  
 NAVMED-MF011.99-9003.05  
 SEALAB I: A PERSONAL  
 DOCUMENTARY ACCOUNT.  
 AD-635 656  
 \*\*\*  
 NAVMED-MR004-14-1200-05  
 AUDITORY FATIGUE UNDERWATER AT  
 1900 CYCLES PER SECOND.  
 AD-624 753  
 \*\*\*  
 NAVMED-MR005.04-0063-2  
 SATURATION-EXCURSION DIVING:  
 BIOCHEMICAL CYCLE FUNCTIONS IN  
 LACTIC DEHYDROGENASE, LACTATE, AND  
 PYRUVATE RESPONSES.  
 AD-678 846  
 \*\*\*  
 NAVMED-MR005.14-1100.06  
 MINIMAL RED LIGHT LEVELS ON  
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 AD-639 176

\*BUREAU OF NAVAL WEAPONS WASHINGTON D C

\*\*\*  
 NAVWEPS-00-18413A-VOL-2  
 HUMAN FACTORS DESIGN STANDARDS  
 FOR THE FLEET BALLISTIC MISSILE  
 WEAPONS SYSTEM. VOLUME 2. DESIGN  
 OF EQUIPMENT.  
 AD-735 045

\*BUREAU OF SHIPS WASHINGTON D C

\*\*\*  
 NAVSHIPS-250-880  
 DIVING MANUAL.  
 AD-653 694

\*CALIFORNIA UNIV LOS ANGELES DEPT OF  
 ENGINEERING

\*\*\*  
 68-61  
 ADAPTATION OF DIVERS TO  
 DISTORTION OF SIZE AND DISTANCE  
 UNDERWATER.  
 AD-684 871

\*\*\*  
 TR-45  
 ADAPTATION OF DIVERS TO  
 DISTORTION OF SIZE AND DISTANCE  
 UNDERWATER.  
 AD-684 871

\*CALIFORNIA UNIV LOS ANGELES SCHOOL  
 OF ENGINEERING AND APPLIED SCIENCE

\*\*\*  
 UCLA-ENG-7052  
 UNDERWATER WORK MEASUREMENT  
 TECHNIQUES 1969 STUDIES.  
 AD-710 348

\*\*\*  
 UCLA-ENG-7140  
 UNDERWATER WORK MEASUREMENT  
 TECHNIQUES:  
 AD-734 014

\*CALIFORNIA UNIV LOS ANGELES  
 BIOTECHNOLOGY LAB

\*\*\*  
 68-11  
 UNDERWATER WORK MEASUREMENT  
 TECHNIQUES: INITIAL STUDIES.  
 AD-668 180

\*\*\*  
 69-19  
 UNDERWATER WORK MEASUREMENT  
 TECHNIQUES: 1968 STUDIES.  
 AD-688 198

\*\*\*  
 TR-44  
 UNDERWATER WORK MEASUREMENT  
 TECHNIQUES: INITIAL STUDIES.  
 AD-668 180

\*\*\*  
 TR-46  
 UNDERWATER WORK MEASUREMENT  
 TECHNIQUES: 1968 STUDIES.  
 AD-688 198

\*DEEP SUBMERGENCE SYSTEMS PROJECT  
 TECHNICAL OFFICE SAN DIEGO CALIF

\*\*\*  
 DSSP-TO-RR-1-68  
 RESULTS OF PHYSIOLOGIC STUDIES  
 CONDUCTED DURING CHAMBER SATURATION  
 DIVES FROM 200 FEET TO 825 FEET. A  
 PRELIMINARY REPORT.

0-2  
 UNCLASSIFIED

UNCLASSIFIED

DUN-DUE

AD-673 532

MOUNLAP AND ASSOCIATES INC DARIEN  
CONN

\*\*\*  
STUDY: FEASIBILITY OF UNDERSEA  
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(NAVTRADEVCEM-69-C-0116-1)

AD-726 427

\*\*\*  
BS067-441  
DIVER PERFORMANCE AND THE  
EFFECTS OF COLD.  
AD-670 031

\*\*\*  
SS066-296(571)  
STUDIES OF DIVERS' PERFORMANCE  
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AD-630 518

\*\*\*  
SS067-399  
STUDIES OF THE PERFORMANCE  
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AD-653 755

MOUNLAP AND ASSOCIATES INC DARIEN  
CONN

\*\*\*  
A PREDICTOR INSTRUMENT FOR  
MANUAL CONTROL.  
AD-288 962

MOUNLAP AND ASSOCIATES INC STAMFORD  
CONN

\*\*\*  
HUMAN FACTORS IN THE DESIGN OF  
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STATION.  
(SPECDEVCEM-641-1-1)

AD-642 738

\*\*\*  
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(SPECDEVCEM-641-2-1)

AD-642 739

\*\*\*  
HUMAN FACTORS IN THE DESIGN OF  
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(SPECDEVCEM-641-2-4)

AD-642 799

\*\*\*  
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ROOM OF GUPPY SUBMARINES.  
(SPECDEVCEM-641-2-3)

AD-642 800

\*\*\*  
A HUMAN ENGINEERING STUDY OF  
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\*\*\*  
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\*\*\*  
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(SPECDEVCEM-641-2-14)

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\*\*\*  
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(SPECDEVCEM-641-2-8)

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(SPECDEVCEM-641-2-10)

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(SPECDEVCEM-954-00-18)

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\*\*\*  
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563/564.  
(SPECDEVCEM-641-2-2)

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0-3  
UNCLASSIFIED

FLO-HUM

UNCLASSIFIED

\* \* \*  
TRAINING AND SUPERVISION OF  
CONTROLLERMEN.  
(SPECDEVCE-641-2-7)  
AD-656 632

\*FLORIDA UNIV GAINESVILLE  
COMMUNICATION SCIENCES LAB  
\* \* \*  
UNDERWATER SPEECH  
COMMUNICATION.  
AD-648 933

\* \* \*  
SPEECH INTELLIGIBILITY OF THE  
BENDIX WATERCOM SYSTEM.  
AD-648 934

\* \* \*  
A DIVER COMMUNICATION RESEARCH  
SYSTEM (DICORS).  
AD-648 935

\* \* \*  
CSL/ONR-32  
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AD-729 054

\*GENERAL DYNAMICS CORP GROTON CTN  
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\* \* \*

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\* \* \*  
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MULTIPLE DISPLAY MONITORING.  
III. TRACKING WHILE MONITORING.  
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\* \* \*  
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\* \* \*  
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\* \* \*  
U411 61 102  
SUBIC: SHIP CONTROL XIV  
ADVANCED FBM SUBMARINE SHIP CONTROL  
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AD-272 913

\* \* \*  
U417-66-024-VOL-1  
ANALYTICAL INVESTIGATIONS OF  
DIGITAL INFORMATION PROCESSING  
SYSTEMS. VOLUME I.  
AD-803 277

\* \* \*  
U-417-68-030  
DIVER PERFORMANCE MEASUREMENT:  
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AD-674 528

\* \* \*  
U417-69-066  
DIVER PERFORMANCE MEASUREMENT:  
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AD-698 310

\* \* \*  
U417-70-043  
CAPABILITIES OF OPERATORS AS  
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AD-716 532

\*GENERAL DYNAMICS/ASTRONAUTICS SAN  
DIEGO CALIF

\* \* \*  
SDA-REL-R-037  
AN OUTLINE OF HUMAN ENGINEERING  
METHODS AND INFORMATION INCLUDING  
MAN-IN-SPACE CONSIDERATIONS.  
AD-677 098

\*HUMAN FACTORS RESEARCH INC BOLETA  
CALIF

\* \* \*  
1700-1  
OPERATOR TARGET DETECTION  
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0-4  
UNCLASSIFIED

UNCLASSIFIED

MIL-NAV

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HUMAN FACTORS RESEARCH INC LOS ANGELES CALIF

\*\*\*  
RESEARCH ON THE DEVELOPMENT OF SHIPBOARD PERFORMANCE MEASURES AND PERFORMANCE JUDGMENTS.  
AD-610 489

\*\*\*  
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\*\*\*  
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IMPROVED OPERATOR DETECTION PERFORMANCE CONSEQUENT TO THE USE OF OPTIMUM BIAS AND GAIN.  
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\*\*\*  
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HUMAN FACTOR PROBLEMS IN ANTI-SUBMARINE WARFARE. SONAR OPERATOR DETECTION PERFORMANCE AT SEA.  
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JOHNS HOPKINS UNIV BALTIMORE MD

\*\*\*  
SPECIAL PROBLEMS IN THE ESTIMATION OF BEARING.  
AD-650 891

HUMAN FACTORS INC SAN DIEGO CALIF

\*\*\*  
MFI-70-117  
EFFECTS OF THE UNDERWATER ENVIRONMENT UPON WORK EFFICIENCY OF DIVERS.  
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MEDICAL COLL OF VIRGINIA RICHMOND DEPT OF PSYCHIATRY

\*\*\*  
A BIBLIOGRAPHICAL SOURCEBOOK OF COMPRESSED AIR, DIVING AND SUBMARINE MEDICINE. VOLUME III.  
AD-656 674

NATIONAL ACADEMY OF SCIENCES-NATIONAL RESEARCH COUNCIL WASHINGTON D C COMMITTEE ON UNDERSEA WARFARE

\*\*\*  
PROCEEDINGS OF THE SYMPOSIUM ON UNDERWATER PHYSIOLOGY (3RD), 23, 24, AND MARCH 1966. WASHINGTON, D. C.  
AD-652 315

NAVAL AIR DEVELOPMENT CENTER JOHNSTOWN PA

\*\*\*  
ED 5828  
UNDERWATER ESCAPE PROGRAM. TESTS OF FBI-1 PILOTS' SURVIVAL EQUIPMENT FOR POSSIBLE USE IN NADEVGEN AUTOMATIC DITCH SYSTEM  
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NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF

\*\*\*  
NCEL-CR-71-009  
A METHOD FOR EVALUATION AND SELECTION OF DEEP OCEAN LOAD HANDLING SYSTEMS. VOLUME 1.  
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\*\*\*  
NCEL-TN-1087  
SEALAB III - DIVER'S ISOTOPIC SWIMSUIT-HEATER SYSTEM.  
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\*\*\*  
NCEL-TN-1174  
SUBMERSIBLE DIVER TOOL POWER SOURCES: ELECTRO-HYDRAULIC AND CRYOGENIC PNEUMATIC.  
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\*\*\*  
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NAV-NAV

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\* \* \*  
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\*NAVAL HOSPITAL GREAT LAKES ILL  
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\* \* \*  
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\*NAVAL MEDICAL RESEARCH INST BETHESDA  
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\* \* \*  
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\* \* \*  
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\*NAVAL MEDICAL RESEARCH LAB NEW LONDON  
CONN

\* \* \*  
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\* \* \*  
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LAB SAN DIEGO CALIF

\* \* \*  
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0-6  
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UNCLASSIFIED

NAV-NAV

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\*NAVAL PERSONNEL PROGRAM SUPPORT  
ACTIVITY WASHINGTON D C PERSONNEL  
RESEARCH LAB  
\*\*\*

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TRAINING IMPLICATIONS.  
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\*\*\*  
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\*NAVAL PERSONNEL RESEARCH ACTIVITY SAN  
DIEGO CALIF  
\*\*\*

NPRA-SRM-68-7  
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\*\*\*  
SRM-67-15  
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\*NAVAL PERSONNEL RESEARCH AND  
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\*\*\*

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\*NAVAL SCHOOL OF AVIATION MEDICINE  
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\*\*\*

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\*\*\*

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\*NAVAL SUBMARINE BASE NEW LONDON CONN  
\*\*\*

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\*\*\*  
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\*\*\*  
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\*\*\*  
SBML-MENO-58-1  
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\*\*\*  
SBML-MENO-58-12  
PHOTOMETRIC SURVEY OF THE RED  
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\*NAVAL SUBMARINE MEDICAL CENTER GROTON  
CONN  
\*\*\*

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\* \* \*  
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\* \* \*

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(NAVMED-MR004-14-1200-05)

AD-624 753

\* \* \*

MR-66-9  
SEALAB II: A PERSONAL  
DOCUMENTARY ACCOUNT.  
(NAVMED-MF011.99-9003.05)

AD-635 656

\*NAVAL SUBMARINE MEDICAL CENTER GROTON  
CONN SUBMARINE MEDICAL RESEARCH LAB

\* \* \*

RESPONSES TO THE UNDERWATER  
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\* \* \*

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\* \* \*

HUMAN FACTORS EVALUATION OF  
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\* \* \*

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LACTIC DEHYDROGENASE, LACTATE, AND  
PYRUVATE RESPONSES.  
(NAVMED-MR005.04-0063-2)  
AD-678 846

\* \* \*  
SMRL-616  
CHARACTERISTICS OF THE  
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AD-708 029

\*NAVAL SUBMARINE MEDICAL RESEARCH LAB  
GROTON CONN

\* \* \*

HUMAN FACTORS EVALUATION OF  
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AD-730 711

\*NAVAL TRAINING DEVICE CENTER ORLANDO  
FLA

\* \* \*

NAVTRADEVCE-69-C-0116-1  
STUDY: FEASIBILITY OF UNDERSEA  
SALVAGE SIMULATION.  
AD-726 427

\* \* \*

NAVTRADEVCE-151-1-16  
THE USE OF HUMAN ENGINEERING  
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AD-639 029

\* \* \*

NAVTRADEVCE-IH-158  
ANNOTATED BIBLIOGRAPHY OF HUMAN  
FACTORS LABORATORY REPORTS (1945-  
1968).  
AD-686 174

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\*MARINE BIOLOGY  
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SATURATED DIVE CONDUCTED BY THE  
UNITED STATES NAVY, THE NATIONAL  
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UNCLASSIFIED

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DESCRIPTION OF THE DIVER'S  
OBSERVATION BOARD: WRITING BOARD,  
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\*SCUBA DIVERS

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